A HAND-BOOK

TO THE

FLORA OF CEYLON.

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FLORA OF CEYLON

CONTAINING

DESCRIPTIONS OF ALL THE SPECIES OF FLOWERING PLANTS INDIGENOUS TO THE ISLAND,

AND

NOTES ON THEIR HISTORY, DISTRIBUTION, AND USES.

BY

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CONTINUED BY

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With an Atlas of Plates

ILLUSTRATING SOME OF THE MORE INTERESTING SPECIES.

Part IV.

EUPHORBIACEÆ—NAIADEÆ.

WITH PLATES LXXVI—C.

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NEW YORK
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PUBLISHED UNDER THE AUTHORITY OF THE GOVERNMENT OF CEYLON.

LONDON:

DULAU & CO., 37 SOHO SQUARE, W.

1898.

.T75
pt. 4

LONDON
PRINTED BY STRANGEWAYS & SONS,
Tower Street, Cambridge Circus, W.C.

PREFACE TO PART IV.

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BEING intrusted by the Government of Ceylon with the completion of Dr. Trimen's Hand-book of the Ceylon Flora (left unfinished through the lamented death of the author), I have to render an account of the materials at my disposal for the above purpose.

Premising that the three Parts already published comprise three-fifths of the contemplated work, I have towards its completion—

1. The Natural Order *Euphorbiaceæ* (by Dr. Trimen), nearly ready for press (about 140 species).
2. A list of the genera and species of all the Orders from after *Euphorbiaceæ* to *Cyperaceæ* inclusive, in the sequence in which Dr. Trimen intended to describe them (*i.e.*, in strict accordance with the Flora of British India), together with such synonyms and references as he thought necessary, habitats, native names (few), and occasional notes. For *Gramineæ*, which are to conclude the work, he left no materials whatever.
3. That portion of the Peradeniya Herbarium which comprises the plants not published in Parts I.–III.; and of the collection of drawings pertaining thereto.
4. The Ceylon collections in the Kew Herbarium, which are much richer than those in that of Peradeniya.

5. The remaining 25 of the 100 quarto lithographed and coloured Plates that accompany this work. These 25 will appear with the present Part.

Thus it appears that my share in the authorship of the Hand-book, as originally contemplated by Dr. Trimen, will be confined to passing his account of the *Euphorbiaceæ* through the press, and to supplying descriptions of all the succeeding Orders, together with a complete account of *Gramineæ*, adding occasional notes on the genera and species where I think it expedient to do so.

In addition to the above, I propose to give in Part V. (1), a key to the Natural Orders of Ceylon Flowering plants, without which the work cannot be of practical use to any but experienced botanists; (2), brief biographical notices, by G. Boulger, Esq., F.L.S., of the botanists who have done most for the advancement of the Sinhalese Flora; (3), two very instructive Maps, of the Rainfall and of the Forest Areas of Ceylon, issued by the Surveyor-General of the Colony, to whom I am greatly indebted for sanctioning this use of them.

Regarding Indexes, it will be observed that a complete Index of the Latin, Sinhalese, and Tamil names of the plants described in Parts I. and II. is appended to Part II. Part III. is not indexed. As I propose to append to Part V. a complete Index to the whole work, I have confined the Index to Parts III. and IV. to generic names.

It remains to add to the above explanations that, in following Dr. Trimen's footsteps, I shall adhere as far as possible to the plan he has adopted, in respect of one point in which I have an observation to make. It refers to the following passage in the Introduction to Part I., p. v.: 'In the definitions of the Orders and Genera, it must be distinctly understood that the distinguishing characters here given for each group do not include the whole of those which

belong to it, but such only as are shown by the species found in Ceylon.' Had the Flora of Ceylon been exhaustively explored, this curtailment of the characters of the Orders and Genera would not interfere with the value of the work for its limited purpose, but such, I feel satisfied, is not the case. There are still large areas of the Forest region which await the visits of keen collectors, and there are not a few common (some amongst the very commonest*) plants of the plains of India that have not as yet been collected in Ceylon.

J. D. HOOKER.

September, 1898.

* Of this a conspicuous example is *Polygonum plebejum*, Br., a weed extending from Africa to Australia; the tropical representative of the European *P. aviculare*, and perhaps the commonest of Indian dicotyledonous plants. Especially abundant in the Madras Peninsula.

CXX.—EUPHORBIACEÆ.

HERBS, shrubs, or trees, with often milky juice; l. alt. and simple, rarely opp. or compound, usually stipulate; infl. various; fl. usually small, often minute, unisexual, sexes dissimilar; perianth simple, or, if double, of cal. and minute pet., sometimes o in one or both sexes; disk often present; stam. 1, few, or many, anth. 2-celled or 3–4-locellate; ov. superior, of 3 or more, rarely 2, more or less united 1–2-ovuled carp.; styles as many as the cells, free or united below (solitary in *Dalechampia*); ovules pendulous from the inner angle of the cells, funicle often thickened; fr. usually a capsule of 3 or more dorsally dehiscing 1–2-seeded cocci separating from a central axis, or a more or less fleshy berry or drupe; seed arillate or not; embryo straight, endosperm fleshy, often oily (o in *Actephila*); cotyledons flat or folded, radicle superior.

Chiefly a tropical Order, one of the largest of flowering plants, and one of the six largest of the Ceylon flora. Of genera not indigenous in the island, but widely cultivated, or more or less naturalised, are the scarlet-bracted *Poinsettia pulcherrima*, of Mexico; the Tallow tree of China, *Excœcaria sebifera;* the American *Manihot utilissima*, yielding Cassava and Tapioca, together with the three recently introduced American Indiarubber-producing plants, *Hevea brasiliensis*, the Para Rubber, *Manihot Glaziovii*, the Ceara Rubber, and *Castilloa elastica*, the Mexican Rubber.—J. D. H.

Infl. of many naked pedicelled stamens surrounding a naked pedicelled ov., all contained in a perianth-like 4–5-lobed involucre (*Euphorbieæ*) . . . . 1. EUPHORBIA.
Infl. of unisexual fl. with a single or double perianth.
  Cells of ov. 2-ovuled.
    Ovules with a ventral raphe (*Buxeæ*) 2. SARCOCOCCA.

Ovules with a dorsal raphe (*Phyllantheæ*).
  Pet. of male fl. distinct; stam. 5.
    Fil. united below in a column; cal. valvate.
      Fr. a drupe . . . . 3. BRIDELIA.
      Fr. a capsule . . . 4. CLEISTANTHUS.
    Fil. nearly distinct; cal. imbricate . . . . 5. ACTEPHILA.
  Pet. and sep. of male fl. confluent in a 6-lobed perianth.
    Annual; fr. of 3 crustaceous cocci . . . . . 6. AGYNEIA.
    Perennial; fr. fleshy . . 7. SAUROPUS.
  Petals 0.
    Male fl. axillary, solitary or fascicled.
      L. alt.
        Fr. of 3 or more crustaceous or coriaceous dry dehiscent cocci.
          Styles free or connate below . . . 8. PHYLLANTHUS.
          Styles confluent in an accrescent column. 9. GLOCHIDION.
        Fr. baccate, enclosing 3 or more dehiscent cocci.
          Styles 3, each twice 2-fid 8. PHYLL. EMBLICA.
          Styles 3, minute, 2-fid . 8. PHYLL. RETICULATUS.
        Fr. baccate, enclosing (cocci-like) seeds with a bony testa.
          Stam. 5, fil. distinct . 10. FLUEGGIA.
          Stam. 3, fil. connate . 11. BREYNIA.
        Fr. a drupe, with a bony 1–4-celled putamen; style-arms broadly dilated.
          Stam. 2–3 . . . 12. PUTRANJIVA.
          Stam. 4 or more.
            Drupe 1-celled, 1-seeded . . 13. HEMICYCLIA.
            Drupe 2-celled, 2-seeded . . 14. CYCLOSTEMON.
      L. whorled . . . . 15. MISCHODON.
    Male fl. in axillary spikes, racemes, or panicles.
      Fl. in catkin-like spikes; fil. 2, long . . . . 16. APOROSA.
      Fl. panicled; fil. 5–8, very short 17. DAPHNIPHYLLUM.
      Fl. loosely spicate; fil. 2–5, long . . . . 18. ANTIDESMA.
Cells of ov. 1-ovuled.
  Male fl. with pets.
    Infl. of 2–3-chotomous cymes . 19. JATROPHA.

Infl. of terminal spikes or racemes 20. CROTON.
Infl. of axillary spikes, racemes, or panicles.
Cal. of male fl. imbricate in bud.
Petals connate . . . 21. GIVOTIA.
Petals distinct.
Sep. of fem. fl. not accrescent.
Stam. 3–5 . . . 22. TRIGONOSTEMON.
Stam. 15–30 . . . 23. OSTODES.
Sep. of fem. fl. accrescent in fr.
Fl. umbelled . . . 24. BLACHIA.
Fl. racemed or clustered 25. DIMORPHOCALYX.
Cal. of male fl. valvate in bud.
Glabrous shrubs or trees . 26. AGROSTOSTACHYS.
Stellate-tomentose herb . 27. CHROZOPHORA.
Fl. apetalous.
Male cal. well developed, valvate in bud.
Fil. distinct.
Anth. 2-celled.
Styles lacerate (see also *Mallotus*).
Sep. of fem. fl. entire . 28. ACALYPHA.
Sep. of fem. fl. lacerate 29. ADENOCHLÆNA.
Styles entire.
Styles united below in a column.
Styles very long . . 30. TREWIA.
Styles short . . . 31. TRAGIA.
Styles distinct, undivided.
Sep. of fem. fl. imbricate 32. PODADENIA.
Sep. of fem. fl. valvate.
Anth. basifixed . . 33. CLAOXYLON.
Anth. dorsifixed . 34. MALLOTUS.
Anth. 4-locellate.
Styles very long, filiform . 35. CLEIDION.
Styles short, recurved . 36. MACARANGA.
Fil. connate in a column or in bundles.
Sep. of fem. fl. entire . . 37. HOMONOIA.
Sep. of fem. fl. laciniate . 38. DALECHAMPIA.
Male cal. well developed, imbricate in bud.
Capsule smooth . . . 39. GELONIUM.
Capsule echinate or warted . 40. CHÆTOCARPUS.
Male cal. minute, open in bud, not enclosing the stam.
Capsule smooth.
Male cal. cupular, 2–3-lobed 41. SAPIUM.
Male cal. of 2–3 distinct sepals . . . . 42. EXCÆCARIA.
Capsule echinate . . . 43. SEBASTIANIA.

1. EUPHORBIA, *L.*

Trees, shrubs, or herbs; l. opp., rarely alt.; fl. monœcious, small, numerous, without a perianth, many male and one fem. arranged in a common perianth-like involucre, with thick glands at the mouth, each gland often bearing a petaloid limb; male fl.:—stam. 1, pedicelled; fem. fl.:—ov. pedicelled, 3-celled with one ovule in each cell, styles 3, free or connate; capsule of 3 cocci separating from a central axis, and each splitting both ventrally and dorsally.—Sp. 600; 52 in *Fl. B. Ind.*

The flower-heads in this genus have all the appearance of a single bisexual flower, especially when the involucre bears petal-like appendages.

Trees, with green fleshy branches (*Euphorbieæ*).
  Styles connate $\frac{1}{2}$ way up . . . . . . 1. E. ANTIQUORUM.
  Styles very slightly connate at base . . . 2. E. TORTILIS.
Dwarf shrub . . . . 3. E. ATOTO.
Herbs.
  Perennial.
    Stem tall, erect; inv.-glands without a limb 9. E. ROTHIANA.
    Stem prostrate; inv.-glands with large limb 4. E. ROSEA.
  Annual.
    Inv.-glands with a large petaloid limb.
      Limb fringed . . . . 5. E. CRISTATA.
      Limb rounded . . . . 6. E. HYPERICIFOLIA.
    Inv.-glands with a small limb or o.
      L. over $\frac{3}{4}$ in., hairy above . . . . 7. E. HIRTA.
      L. under $\frac{1}{2}$ in., glabrous above . . . 8. E. THYMIFOLIA.

1. **E. Antiquorum,** *L. Sp. Pl.* 450 (1753). **Daluk,** *S.* **Chatura-kalli,** *T.*

Burm. Thes. 96. Fl. Zeyl. 199. Moon, Cat. 37. Thw. Enum. 268. C. P. 2944.

Fl. B. Ind. v. 256. Wight, Ic. t. 897. Bedd. Forest. Man. t. xxii. f. 4. Rheede, Hort. Mal. ii. t. 42.

A tree, 15–30 ft.; trunk stout, often 3 ft. or more in circumference, cylindrical or fluted; bark thick, very rough and corrugated, brown; branches numerous, curving upwards, young whorled, stout, fleshy, green, jointed, with 3 very wide thick wings which are narrowed to either end in each joint, and very coarsely repand-crenate; l. very small, $\frac{1}{4}$–$\frac{1}{2}$ in., sessile on summit of each crenation, cuneate, truncate, glabrous, fleshy, soon falling; stip. spines, short, sharp, divaricate, persistent; fl. heads in small shortly stalked cymes of 3, the central one sessile, the 2 lat. on long stout ped.; inv. glands 5, very large, much broader than long, fleshy; male fl. (stam.) numerous, mixed with many laciniate bractlets; fem.

fl.:—ov. nearly sessile, styles combined for half their length; capsule 3-lobed, rather depressed, lobes ovoid, slightly compressed.

Low country, in rocky and stony places, especially in the dry region; common. Fl. Sept.–Feb.; greenish-yellow, ov. pink.

Also in Peninsular India.

A very abundant tree in the dry forests near the coast, and familiar to all travellers, by whom it is generally called a 'cactus.' I have never seen more than 3 wings to the branches, though Wight says that in India the number is most variable. The plant usually appears leafless, as the small fleshy leaves are quickly deciduous. The whole plant affords a very viscous, acrid, milky juice.

2. **E. tortilis,** *Rottler ex Wight, Ic.* iii. 2, 9 (1845). **Sinuk,** *S.*
Thw. Enum. 268. C. P. 2943.
Fl. B. Ind. v. 256. Wight, Ic. t. 898.

A small tree, 8–20 ft., much branched; young branches jointed, fleshy, more slender than in *E. Antiquorum*, whorled, ascending, with 3 (rarely 4) broad fleshy wings, which are coarsely serrate-crenate, often spirally twisted, pale yellowish-green; l. 0, or very quickly deciduous; stip. spines minute, very sharp, at summit of each crenation, brown; fl.-heads much smaller than in *E. Antiquorum*, on very short stout ped., in trichotomous cymes from the stem sinuses; inv.-glands large, broader than long, thick, glabrous; male fl. several, mixed with numerous fimbriate bractlets; fem. fl.; ov. shortly stalked, styles very shortly connate at base, spreading, minutely bilobed; capsule very small, lobes ovoid-globose, not compressed.

In similar places to *E. Antiquorum*, but much rarer. Between Nalande and Dambulla, abundant; Dambulla Hill. (The C. P. specimens are from the Peradeniya Gardens.) Fl. Oct.–Feb.; greenish-cream-coloured.

Also in S. India.

I very much doubt if the Ceylon plant is rightly referred to this species. It certainly accords badly with Wight's figure. Wight gives no locality. There is no specimen in Rottler's Herbarium at Kew.

The branches are frequently 4-winged, and often, but by no means invariably, have a distinct spiral twist. I have never seen any leaves. Affords an abundant sticky milk.

E. neriifolia, L. Thw. Enum. 268. *Patak*, S., a native of India; is sometimes cultivated. It is Fl. Zeyl. n. 200, and given by Moon (Cat. 37) as if a native. It has obscurely 5-angled branches and short stipular thorns.

E. Tirucalli, L., Thw. l.c., *Nawahandi*, S., *Kalli*, T., is much used for fences in the low country, especially in the dry region, and called 'milk-hedge by the English. It is supposed to have been introduced

by the Portuguese from E. tropical Africa, where it is native, and is Fl. Zeyl. n. 196. It grows to a considerable tree if not cut or clipped, and may be recognised by its being thornless and having cylindric branches.

3. **E. Atoto**, *Forst. Prod.* n. 207 (1786).
E. maritima, Moon, Cat. 38. Thw. Enum. 427 (*E. bifida*, Thw. var. Hk. and Arn.), 269. C. P. 2131.
Fl. B. Ind. v. 248. Rheede, Hort. Mal. x. t. 58.

A dwarf shrub, stem usually prostrate or decumbent, stout, much branched, glabrous and shining, thickened at nodes; l. opp., shortly petiolate, $\frac{3}{4}$–1 in., oval or oblong-oval, obtuse at both ends, entire, glabrous, the upper ones not imbricating; fl.-heads axillary, or in small terminal cymes, stalked; inv.-glands oblong, inconspicuous; capsule glabrous; seeds smooth.

Seashore; rare. Batticaloa; Aripo; Trincomalie; Galle. Fl. Dec.–April.
Also on the coasts of Malabar, Andaman Is., Malaya, China, Pacific Is., Australia.
There are Ceylon specimens from Kœnig in Mus. Brit.

4. **E. rosea**, *Retz. Obs. Bot.* iv. 26 (1786). **Mudu-dada-kiniya**, *S.*
Thw. Enum. 269. C. P. 2126, 2129.
Fl. B. Ind. v. 251.

A perennial herb, with a long woody tap-root and a short flattened rootstock; stems very numerous, prostrate, spreading, slender, flexuose, glabrous; l. numerous, opp., $\frac{1}{2}$–1 in., oblong strap-shaped or linear-spathulate, rounded and very unequal at base, rounded at apex, glabrous, rather thick; petiole short; stip. interpetiolar, triangular; fl.-heads few, stalked, in small axillary nearly sessile cymes; inv. campanulate, glabrous, glands with large petaloid conspicuous rounded appendages, broader than long; capsule small, slightly rough, lobes bluntly keeled; seeds transversely wrinkled.

Sandy seashores; common, especially in dry region; rarely inland, as shore of Mineri Tank. Fl. Dec.–Feb.; bright pink.
Also in S. India and Afghanistan.
The bright pink colour of the involucral gland-appendages renders the flowers decidedly conspicuous. Kœnig's type-specimens (Mus. Brit.) are from Ceylon. C. P. 2126, from Batticaloa, is a very narrow-leaved form.

5. **E. cristata**, *Heyne in Roth, Nov. Sp.* 226 (1821).
E. fimbriata, Heyne in Roth, Thw. Enum. 269. C. P. 3568.
Fl. B. Ind. v. 247. Boiss, Ic. Euphorb. t. 8 (*E. fimbriata*).

Annual; stem erect or spreading, 6–12 in., much branched, slender, cylindrical, more or less clothed with scattered white

hair; l. opp., very shortly petiolate, $\frac{1}{2}$–$\frac{3}{4}$ in., oblong-oval, very unequal-sided and subcordate at base, obtuse, finely serrate in upper part, slightly hairy on both sides, the upper ones more orbicular, crowded and imbricated round the fl.-head; inv.-glands usually 4, with large spreading petaloid fringed limbs; capsule very small, hairy; seeds slightly rough, with a few transverse ribs and furrows, white.

Dry region; very rare (?). Gunner's Quoin, Batticaloa Dist.; Nilgala, Uva. Fl. Jan.–March; pinkish-green.
Also in Peninsular India and Burma.

6. **E. hypericifolia,** *L. Sp. Pl.* 454 (1753). **Ela-dada-kiriya,** *S.*
Herm. Mus. 47. Burm. Thes. 224. Fl. Zeyl. n. 504. Thw. Enum. 268. *E. parviflora.* L. Syst. Nat. ed. 10, 1047 (1759); Moon, Cat. 38. C. P. 2125.
Fl. B. Ind. v. 249. Burm. Thes. t. 105, f. 2.

Annual, 6–18 in., spreading or erect, usually with long ascending branches from the base; stem cylindrical, usually slightly pubescent; l. opp., very shortly petiolate, $\frac{1}{2}$–1 in., oval-oblong, rounded and usually unequal at base, obtuse, faintly denticulate-serrate, slightly pubescent and whitish beneath, with prominent veins; fl.-heads minute, stalked, in small very shortly peduncled axillary cymes; inv. oblong, glabrous, lobes small, lanceolate, glands with a large rotundate white petaloid limb; styles, short, bifid; capsule very small, lobes rounded, slightly hispid; seeds smooth.

Waste and cultivated ground; a common weed. Fl. Sept.–Dec. &c.; white or pinkish.
Throughout the Tropics, except Pacific Is. and Australia.
The Ceylon plant is *E. parviflora*, L., maintained as distinct by many botanists. It varies but slightly except in habit, being usually slender and more or less decumbent, but occasionally quite erect with stout stems.
There is only a drawing, no specimen, in Herb. Herm.

7. **E. hirta,** *L. Sp. Pl.* 454 (1753). **Budadakiriya,** *S.* **Palavi,** *T.*
Herm. Mus. 31. Burm. Thes. 223, 224. *E. pilulifera*, L. l.c. Moon, Cat. 37, 38. Thw. Enum. 269. C. P. 3337.
Fl. B. Ind. v. 250 (*E. pilulifera*). Burm. Thes. tt. 104, 105, f. 1.

Annual; stem 6–12 in., decumbent, ascending, or erect, cylindrical, rather stout, with more or less copious spreading bristly hair; l. opp., $\frac{3}{4}$–1$\frac{1}{2}$ in., on very short petioles, lanceolate-oblong, very unequal-sided, acute or subacute, serrate, sparingly hairy on both surfaces, pale glaucous or pinkish, and with prominent veins beneath; stip. pectinate, soon

falling; fl.-heads minute, numerous, shortly stalked, crowded in small rounded pedunculate axillary cymes; inv. very small, glands obscure or 0; capsule minute, adpressed-hairy, lobes keeled; seeds ovoid-trigonous, transversely wrinkled, bright light brown.

Cultivated ground; a very common weed. Fl. all the year; greenish. Throughout the Tropics.

The names *hirta* and *pilulifera* are of equal authority, and either may be used.

8. **E. thymifolia,** *L. Sp. Pl.* 454 (1753). **Bin-dadækiriya,** *S.* **Chittirapalavi,** *T.*

Burm. Thes. 225. Fl. Zeyl. n. 198. Moon, Cat. 38. *E. Burmanniana*, Gay. Thw. Enum. 269. C. P. 2128.

Fl. B. Ind. v. 252. (*E. Burmanniana*). Burm. Thes. t. 105, f. 3 (good).

Small, annual; stems depressed-prostrate, cylindrical, divaricately branched, hairy; l. opp., very small, $\frac{1}{6}$–$\frac{1}{3}$ in., oblong-oval, rounded and very oblique at base, rounded at apex, dentate-serrate, glabrous above, glaucous and slightly hairy beneath; petiole very short; stip. minute, serrate; fl.-heads very small, sessile, 1–3 in axil; inv. campanulate, hairy, lobes very short, glands 0, or very minute; capsule with bluntly keeled lobes, hairy.

Waste and cultivated ground; a common weed. Fl. all the year; pinkish.

Throughout the Tropics, except N. Australia.

Whole plant often has a pale coppery tinge.

The severed end of a branch, made to touch lightly the surface of water, has the singular effect of violently repelling to a considerable distance all floating particles in the neighbourhood.

E. microphylla, Heyne in Roth, Nov. Sp. (?). Under the name of *E. Chamæsyce*, Thwaites (Enum. 269) records C. P. 2655. The specimens were collected by Glenie at Trincomalie in 1859, but are so very fragmentary as to be quite useless for determination.

9. **E. Rothiana,** *Spreng. Syst. Veg.* iii. 796 (1826).

Thw. Enum. 269. *E. oreophila*, Miq.; Trim. Syst. Cat. 78. C. P. 2124.

Fl. B. Ind. v. 263. Wight, Ic. t. 1864.

Perennial herb; stem about 2 ft., erect, cylindrical, glabrous, branched above, glaucous; l. alt., sessile, $2\frac{1}{2}$–4 in., linear-lanceolate, tapering to both ends, acute, entire, glabrous, floral ones (bracts) opp., ovate, rounded at base, mucronate; fl.-heads in the bifurcations of large lax dichotomous terminal cymes; inv. small, glabrous, campanulate, villous within, lobes

very short, ciliate, glands large, broad, 2-horned; capsule with rounded lobes, glabrous, pale brown; seeds oblong-ovoid, smooth, blue-black.

Shady places in the montane zone, 3–7000 ft.; common. Fl. Sept.–Dec.; green.
Also in Peninsular India.

E. læta, Heyne in Roth, Nov. Sp. 230, seems the oldest name (1821), and ought to be retained (as *E. læta*, Ait. is reduced to *E. dendroides*, L.).

2. **SARCOCOCCA,** *Lindl.*

Shrub; l. alt.; fl. monœcious, in axillary clusters, bracteate; cal.-segm. 4, distinct, imbricate; male fl.:—stam. 4, opp. sep.; fem. fl.:—ov. 2-celled with 2 collateral ovules in each cell, raphe of ovule ventral, styles 2, undivided; fr. a drupe, endocarp bony; seed solitary or 2, endosperm fleshy, cotyledons broad, flat.—Sp. 2 or 3; 1 in *Fl. B. Ind.*

This genus, along with the box and a few others, is regarded by some authors as belonging to a different Order (*Buxeæ*) from *Euphorbiaceæ*, characterised chiefly by the raphe of the ovule being ventral.

S. pruniformis, *Lindl. in Bot. Reg.* t. 1012 (1826).
Thw. Enum. 290. *S. saligna*, var. *brevifolia*, Muell. Arg. in DC. Prod. xvi. 1, 12. C. P. 203.
Fl. B. Ind. v. 266. Wight, Ic. t. 1877 (*S. trinervia*).

Shrub, 4–8 ft., much branched; branchlets long, virgate, somewhat angular, glabrous, green; l. numerous, alt., very variable, 1½–3½ in., broadly ovate to narrowly lanceolate, tapering to base, acuminate or caudate, acute, often somewhat falcate, entire, glabrous, basal pair of lat. veins usually distinct, making l. 3-nerved; petiole ¼ in., slender; fl. on short more or less bracteate ped., in small axillary racemes or clusters; cal.-segm. obtuse, glabrous; styles short, recurved; drupe ¼–⅜ in., oblong-ovoid, tipped with style-bases, smooth, purple.

Var. β, **zeylanica,** *Hk. f.* *S. zeylanica*, Baill. Mon. Bux. 52; Muell. Arg. l.c. 12.
Male fl. 4-bracteolate; fruit shorter.
Var. γ, **brevifolia,** Muell. Arg. l.c. Male fl. without bracts.

Montane zone, especially in the higher elevations; common. Fl. all the year; green.
Also in mountains of India, Afghanistan, and Sumatra.
The leaves vary much in width, the broadest occurring at the highest elevations.

3. **BRIDELIA,** *Willd.*

Trees or shrubs, rarely scandent; fl. small, diœcious or monœcious, in axillary clusters or spikes, dichlamydeous; cal.-segm. 5, valvate; pet. 5, inserted on cal., very small, disk conspicuous, annular in male, tubular in fem.; stam. 5, fil. united below into a column, distinct and spreading above; pistillode terminating the column; ov. 2-celled with 2 ovules in each cell, styles 2, forked; fr. a drupe with two 1-seeded pyrenes.—Sp. 30; 18 in *Fl. B. Ind.*

Erect, leaf-veins more than 10 pair.
Fr. globose . . . . 1. B. RETUSA.
Fr. ovoid, acute . . . . 2. B. MOONII.
Scandent, leaf-veins less than 7 pairs . . . . 3. B. SCANDENS.

1. **B. retusa,** *Spreng. Syst. Veg.* iii. 48 (1826). **Keṭa-kala,** *S.* **Mul-venkai,** *T.*

Herm. Mus. 27. Fl. Zeyl. n. 367. *Cluytia retusa*, L. Sp. Pl. 1042; Thw. Enum. 279. C. P. 2161.

Fl. B. Ind. v. 268. Bedd. Fl. Sylv. t. 260.

A small tree; bark smooth, pale yellowish-grey; young twigs rusty-pubescent; l. numerous, alt., $3\frac{1}{2}$–$4\frac{1}{2}$ in., oblong-oval, usually rounded at base, very obtuse or rounded at apex, often emarginate, entire; lat. veins 16–20 pair, strong, parallel, uniting with a transparent marginal one, and connected by numerous fine transverse veinlets, glabrous and bright green above, whitish, with minute pubescence beneath, rather thick; petiole short, stout, finely pubescent; stip. lanceolate, with a broad base, very acuminate, pubescent, deciduous; fl. diœcious, on very short ped., in small dense clusters on spicate or rarely branched axillary, infl. often exceeding l.; bracts ovate, acute, deciduous; male fl. $\frac{1}{6}$ in., cal.-segm. narrowly triangular, acute, spreading; pet. much smaller, deeply pectinate; disk thick and pulpy; fem. fl. smaller; cal. as in male; pet. spathulate, acute, not pectinate, persistent; disk truncate, enclosing ov.; styles short; fr. seated on persistent cal. and pet., over $\frac{1}{4}$ in., globose, slightly pulpy, purplish-black, pyrenes thin.

Moist low country, up to 2000 ft.; common. Fl. June, July; green, tinged with red, disk purple.

India, Burma, Malacca.

The leaves are minutely and beautifully reticulate beneath, with minute pits in the ultimate meshes. Often mistaken for a Dipterocarp. Timber useful for house-building.

2. **B. Moonii,** *Thw. Enum.* 279 (1861). **Pat-kala,** *S.*
Muell. Arg. in DC. Prod. xv. 2, 497. *Cluytia retusa*, Moon, Cat. 71 (non L.).
Fl. B. Ind. v. 268.

Characters those of *B. retusa*, but l. usually larger, 4–6 in., more acuminate, with fewer (11–15 pair) lat. veins, and less white, and not so minutely reticulate beneath; fl. 'monœcious' (? always), in axillary clusters only; fr. about $\frac{1}{3}$ in., ovoid, tapering to both ends, acute at apex.

Moist low country, up to 2000 ft.; common. Fl. June.
Endemic.
I doubt if this be distinct from *B. retusa*, but the shape of the fruit appears to characterise it, and the ultimate venation of the leaves is different.

[In a drawing (in Herb. Peradin.) some of the leaves are as rounded at the apex as in *B. retusa*, and the berries, 1½ in. long, are rounded at both ends, the pyrenes rugose.—J. D. H.]

3. **B. scandens,** *Willd. Sp. Pl.* iv. 979 (1805).
C. P. 3932.
Fl. B. Ind. v. 270 (*B. stipularis*). Roxb. Cor. Pl. t. 173.

A scandent shrub; young branches long, slender, twigs slightly pubescent; l. 1–2 in., on very short petioles, oblong-oval, subacute, very shallowly crenate, glabrous above, pale and slightly pubescent beneath, lat. veins 5 or 6 pair; fl. 'monœcious' in small, very dense axillary clusters; cal. very hairy outside, segm. narrow, acute; fr. 'oblong, nearly ½ in. long, obtuse, smooth, bluish-black.'

Moist low country; very rare. Below Alagalla (Ferguson). Fl. Dec.; pale green.
India, Malaya, Philippine Is., Tropical Africa.
I have seen only the C. P. specimens, which are poor and have no fruit.

4. CLEISTANTHUS, *Hk. f.*

Small trees; fl. in axillary clusters, rarely in spikes, monœcious (sometimes diœcious?); cal.-segm. 4–6, valvate; pet. very small, often bifid; male fl.:—disk broad; stam. 5, fil. more or less connate below in a column; pistillode small, terminating column; fem. fl.:—disk large, lobed; ov. 3-celled, with 2 ovules in each cell; styles 3, bifid; fruit dry, 3-lobed; seeds exarillate, endosperm copious or scanty, cotyledons thin or fleshy, flat or folded.—Sp. about 30; 28 in *Fl. B. Ind.*

Fr. large, $\frac{3}{4}$ in., seeds globose . . . . . . 1. C. COLLINUS.
Fr. small, $\frac{1}{2}$ in. or less, seeds not globose.
  Cal. glabrous . . . . 2. C. ACUMINATUS.
  Cal. pubescent.
    L. coriaceous . . . . 3. C. ROBUSTUS.
    L. not coriaceous.
      Fr. glabrous when mature.
        L. more or less rounded at base . . 4. C. PATULUS.
        L. tapering to base . . . . . . 5. C. PALLIDUS.
      Fr. with rusty tomentum . . . . . 6. C. FERRUGINEUS.

1. **C. collinus,** *Benth. in Gen. Pl.* iii. 268 (1880) **Madaru,** *S.*
Amanoa collina, Baill.; Thw. Enum. 280 *Lebidieropsis orbicularis*, Muell. Arg. in Linnæa, xxxii. 80. C. P. 2163.
Fl. B. Ind. v. 274. Roxb. Cor. Pl. t. 169. Bedd. For. Man. t. 23, f. 5.

A small tree; branches stout, spreading; bark corky, pustulate, reddish-grey; young twigs pubescent; l. few, rather large, 2–4 in., broadly oblong-oval, shortly petioled, very obtuse or rounded at apex, glabrous, rather pale beneath, venation reticulate; fl. very shortly stalked, in axillary clusters; cal. hairy; sep. lanceolate, acute; pet. very minute; male fl.:—disk broad, circular; fil. connate half way up; fem. fl.:—styles bifid; fr. large, $\frac{3}{4}$ in. diam., depressed-globose, very indistinctly 3-lobed, smooth, shining, woody, brown; seeds nearly globose, dark brown, endosperm scanty.

Low country; very rare. Sabaragamuwa Prov. (Gardner); Kolona Korale (Thwaites); Bintenne (Wace). Fl. June; yellowish.

This seems to form a genus distinct from *Cleistanthus.* It appears to be usually diœcious.

The heart-wood is very hard and dark red. Bark and fruit said to be very poisonous.

2. **C. acuminatus,** *Muell. Arg.* in DC. Prodr. xvii. 508 (1866).
Amanoa acuminata, Thw. Enum. 428. C. P. 2164.
Fl. B. Ind. v. 276.

Small tree; twigs numerous, slender; bark smooth, greyish-brown; young parts glabrous; l. 2–4 in., on short petioles, ovate, long-acuminate, entire, but somewhat undulate, thin but stiff, shining, slightly bullate between veins; fl. in small dense clusters, sessile; bracts minute; cal. glabrous, segm. triangular-oval; pet. very small, obovate-rotundate, in male slightly lobed; stam. column short, thick; ov. hairy, styles spreading; capsule small, deeply 3-lobed, crustaceous, glabrous or very nearly so, yellowish or reddish.

Moist low country, below 1000 ft. Colombo (Ferguson); Galle. Endemic.

There is a specimen in Herb. Hermann; and it is Fl. Zeyl. n. 431, among the 'Dubiæ,' and not named by Linnæus.

3. **C. robustus,** *Muell. Arg. l. c.* 504 (1866).
Amanoa indica, Thw. Enum. 428 (non Wight). C. P. 3721.
Fl. B. Ind. v. 279.

A small tree with slender twigs; young parts glabrous; l. 3–7 in., oblong-oval or ovate, acute at base, acuminate-caudate, subcoriaceous, glabrous and shining above, pale and with rather conspicuous reticulate venation beneath; petiole stout; fl. sessile, in axillary clusters, or in distant spreading spikes shorter than l.; cal. pubescent, segm. acute; disk of fem. fl. with acute lobes; capsule $\frac{3}{8}$ in., globose-pyriform, 3-lobed, glabrous.

Moist low country, below 1000 ft.; rare. Hewessee. Fl. March.
Endemic.
Dries a dark coppery brown.

4. **C. patulus,** *Muell. Arg. in DC. Prod.* xv. ii. 505 (1866).
Amanoa indica, forma *minor*, Thw. Enum. 428. C. P. 2151.
Fl. B. Ind. v. 279. Wight, Ic. t. 1911 (*Amanoa indica*). Bedd. For. Man. t. xxiii. f. iv.

A small tree with very slender twigs; young parts pubescent; l. numerous, small, $1\frac{1}{2}$–3 in., ovate, rounded or subacute at base, acuminate-caudate, obtuse, stiff, glabrous and shining above, paler beneath; fl.-clusters very small, in very lax axillary spikes; cal. pubescent, segm. lanceolate, acute; pet. very small, rotundate; ov. hairy; capsule over $\frac{1}{4}$ in., faintly 3-lobed, usually apiculate, smooth.

Moist low country, below 1000 ft.; rather rare. Radnapura and other places in Sabaragamuwa. Fl. March; yellow.
Also in S. India.

5. **C. pallidus,** *Muell. Arg. l. c.* 508 (1866). **Visa,** *T.*
Amanoa pallida, Thw. Enum. 280. C. P. 2166.
Fl. B. Ind. v. 279. Bedd. For. Man. t. 23, f. 4.

A small much-branched tree; twigs slender; bark greyish-brown; young parts hairy; l. very numerous, on very short petioles, $1\frac{1}{2}$–$4\frac{1}{2}$ in., lanceolate or oval-lanceolate, tapering to base, acuminate acute or obtuse, glabrous above, slightly pilose, pale, and with prominent venation beneath; stip. subulate, semi-spinous; fl. sessile; bracts subulate; cal.-segm. lanceolate, acute, pubescent; ov. densely tomentose, styles very shortly bifid; capsule near $\frac{3}{8}$ in., distinctly 3-lobed, at first hairy, but becoming glabrous, or nearly so.

Var. β, **subglauca,** *Trim. Syst. Cat.* 78. C. P. 3981.

L. smaller, narrower, more acuminate, glaucous beneath.

Low country in both regions, up to 2000 ft.; rather rare. Dambulla; Ritigala; Harogama; Tlanguranketa; Yattiantota. Var. β, Pasdun Korale. Fl. April; pale green.

Endemic.

Very variable in the size of the leaves.

6. **C. ferrugineus,** *Muell. Arg. l. c.* 507 (1866).
Amanoa ferruginea, Thw. Enum. 280. C. P. 2407.
Fl. B. Ind. v. 280.

A small tree; bark dark brown; twigs numerous; young parts rusty-pubescent; l. 3–5 in., lanceolate, acuminate, acute, on short petioles, stiff, pale, and with rather prominent veins beneath; fl.-clusters sometimes on short peduncles; cal. rusty-pubescent, segm. oval-oblong, subacute; pet. very small, bifid; capsule ½ in. broad, depressed, shortly stalked, strongly 3-lobed, rusty-tomentose.

Moist low country, to 3000 ft. Ambagamuwa; Hantane. Fl. March.
Endemic.

5. ACTEPHILA, *Bl.*

A tree; l. entire, with minute stip.; fl. monœcious or diœcious, in small clusters, dichlamydeous; cal.-segm. 5, imbricate; pet. 5, small; male fl.:—disk prominent, fleshy; stam. 5, fil. connate below in a stout column; pistillode columnar, with 3 spreading arms; fem. fl.:—disk flattened, expanded, lobed; ov. 3-celled, with 2 ovules in each cell; styles 3, short, bifid; fr. a rather large dry woody capsule, 3-celled, 3-valved; seeds usually 3, endosperm 0, cotyledons fleshy, unequal, folded, radicle very short.—Sp. about 10; 2 in *Fl. B. Ind.*

A. neilgherrensis, *Wight, Ic.* v. 2, 29 (1852).
Saira zeylanica, Baill. Et. Euphorb. 571. *A. zeylanica*, Muell. Arg. l.c. 221.
Thw. Enum. 280. C. P. 2532, 3430, 3431.
Fl. B. Ind. v. 283 (*A. excelsa*). Wight, Ic. t. 1910. Bedd. For. Man. t. xxiii. f. 3 (*A. excelsa*).

A small tree; bark greyish-brown, lenticellate, marked with leaf-scars; young parts glabrous; l. very variable, 2–10 in., oblong-lanceolate linear-oblong or broadly oval, obtuse subacute or caudate-acuminate, tapering to base, on longish petioles, glabrous; stip. deciduous; fl. small, male on short ped., fem. on ped. ¾ inch long and thickened upwards, in small axillary clusters; bracts short, hairy; male fl.:—cal.-segm. broadly oval, obtuse; pet. wedge-shaped, often incised or

bifid; fem. fl.:—cal.-segm. and pet. as in male; disk lobed, yellow; staminodes 0; ov. depressed-globose, styles short, thick, divaricate, bifid; fr. 1–1¼ in., on longish stalks, depressed, seated on persistent cal. and pet., 3-lobed, dark green.

Moist region, up to 6000 ft.; rather common. Kalutara (Moon); Colombo; Weligama, &c., in Pasdun Korale; Medamahanuwara; Dolosbagie; Elephant Plains; Hakgala. Fl. Sept.–Dec.; pale green, pet. white, disk yellowish.

Hills of India, Burma, Andaman Is., Java.

Extremely variable in size and shape of leaves. It is frequently monœcious, and thus the principal character for *A. zeylanica* fails.

6. AGYNEIA, *Vent.*

Annual, with prostrate stems and fleshy l.; fl. monœcious, dichlamydeous, axillary, fem. much larger than male; male fl.:—sep. and pet. combined to form a flat thickened viscous perianth, segm. 6; stam. 3, connate into a short column, anth. minute, capitate, sessile; pistillode 0; fem. fl.:—sep. 3, distinct; pet. 3, similar; ov. truncate, 3-celled with 2 ovules in each cell, styles 3, sunk in the top of the ovary, deeply bifid; fr. small, splitting into 3 two-seeded cocci; seeds slender, curved, hilum long, endosperm fleshy, embryo curved, cotyledons broad flat.—Sp. 2; 1 in *Fl. B. Ind.*

A. bacciformis, *A. Juss. Tent. Euphorb.* 24 (1824). **Et-pilawakka,** *S.*

Thw. Enum. 283. C. P. 2130.

Fl. B. Ind. v. 285. Wight, Ic. t. 1893 (not good). Baill. Et. Gen. Euph. t. 24, f. 10–14.

Annual, with a large tap-root and many prostrate or ascending, much-branched, angular, glabrous stems; l. small, ¼–¾ in., nearly sessile, oval-oblong, obtuse, sometimes apiculate, fleshy, glaucous; stip. minute, ovate, acute; fl. on short filiform ped., axillary, male minute, female much larger; bracts acicular; male fl.:—perianth much thickened except at margin, segm. rounded, denticulate; anth. adnate; fem. fl.—sep. ovate, acute, imbricate; pet. rather smaller; ov. clavate, thickened upwards, bluntly trigonous, flat-topped, styles spreading; fr. seated on persistent sep. and pet., ovate-ovoid, truncate.

Sandy seashores; common. Fl. Jan.; pale green.

Coasts of India, Java, Mauritius.

7. **SAUROPUS,** *Bl.*

Shrubs; fl. small, monœcious (or diœcious?), mono-dichlamydeous, axillary; male fl.:—perianth-tube either large and dilated with 6 very short segm., or short with long segm.; stam. 3, fil. connate into a short flat-topped column, anth. sessile; pistillode 0; fem. fl.:—per.-segments 6, nearly distinct, persistent and enlarged in fruit; ov. pear-shaped, truncate or hollowed on top, 3-celled, with 2 ovules in each, cell, styles 3, bifid; fr. fleshy but dehiscent, with 6 crustaceous cocci; seeds 6, endosperm fleshy, cotyledons broad, flat.—Sp. about 20; 15 in *Fl. B. Ind.*

L. over 1 in.
  Per.-segm. broad, flat, very short.
    Per. of male fl. flattened and disciform . . . 1. S. ALBICANS.
    Per. of male fl. everted and reflexed . . . . 2. S. RETROVERSA.
  Per.-segm. long, linear, fleshy . . . . . 3. S. ASSIMILIS.
L. under 1 in. . . . . 4. S. RIGIDUS.

1. **S. albicans,** *Bl. Bijd.* 596 (1825). **Mella-dum-kola,** *S.*
S. Gardnerianus, Wight, Ic. vi. 6; Thw. Enum. 284. *S. zeylanicus.* Wight, l.c. C. P. 2146.
Fl. B. Ind. v. 332. Wight, Ic. t. 1951, fig. 2 (*S. Gardnerianus*), and t. 1952 (*S. zeylanicus* and *S. indicus*).

A small shrub with many elongated smooth green branches; l. on very short petioles, $1\frac{3}{4}$–$2\frac{1}{4}$ in., ovate-lanceolate or ovate, obtuse at base, acute, entire, thin, pale green, whitish beneath; stip. minute, acicular; fl. on long ped., male in small clusters, fem. solitary, drooping; male fl.:—per.-tube large, contracted at mouth, much flattened, so as to be disciform, thickened, segm. very short; fem. fl.:—per.-segm. rounded, style-arms recurved; fr. rather large, about $\frac{3}{4}$ in. diam., pendulous, globose, fleshy; seeds hard, black.

Moist region, 2–5000 ft.; rather common. Fl. April–Aug.; yellowish-green.
Travancore, E. Bengal, Burma, Malaya, Philippine Is.
The rather large pendulous fruit is pale whitish or yellowish-green. When dried, the plant has the scent of celery.

2. **S. retroversus,** *Wight, Ic.* vi. 6 (1853).
Thw. Enum. 284. C. P. 3134.
Fl. B. Ind. v. 333. Wight, Ic. t. 1951. f. 1.

Very like *S. albicans*, but differs in the perianth of the male fl. being completely everted and reflexed, so as to appear pileate with the stam.-column on its summit, lobes (at base) very short, tooth-like, 6 or 12; fem. fl. as in *S. albicans;* fr. (ex Thwaites) 1 in., pyriform, white.

Montane zone; very rare. Uda-pussolawe Dist., at about 4000 ft. Fl. April.

Endemic.

I have not met with this, and seen only the C. P. specimens. Thwaites briefly describes fem. fl. and fruit, but there are neither on his specimens in Herb. Perad. I am inclined to agree with Sir J. Hooker, that this is merely an abnormal form of the last, not a separate species.

3. **S. assimilis,** *Thw. Enum.* 284 (1861).
Muell. Arg. l. c. 242. C. P. 2855.
Fl. B. Ind. v. 333.

L. $1\frac{1}{2}$–3 in., oblong-lanceolate, acute, very shortly petioled, thin, glaucous beneath; male fl. on very slender ped.; perianth divided almost to base, segm. equal, cylindrical, obtuse, curved, hollowed at base; fem. fl.:—per.-segm. oval, flat, acute; ov. truncate, styles hooked; fr. not seen.

Moist region; very rare. Allagala, at 3000 ft.; Hiniduma Patta. Fl. May–Aug.; greenish-yellow.

Endemic.

I have but scanty material for this species. The female fl. above described are on a separate branchlet, but seem to belong to the species.

4. **S. rigidus,** *Thw. Enum.* 284 (1861).
Muell. Arg. l. c. 243. C. P. 2135.
Fl. B. Ind. v. 336.

A small, rigid, much-branched shrub, 1–2 ft. high; branches angular, glabrous; l. small, $\frac{1}{4}$–1 in., on very short petioles, rotundate or broadly oval, obtuse, often somewhat tapering at base; fl. monœcious (sometimes diœcious?) on short slender ped., which are clothed below with imbricate bracts; fem. much larger than male; male fl.:—per.-segm. irregularly triangular, thickened at base, margin sinuate; fem. fl.:—per.-segm. obovate, obtuse, apiculate; ov. truncate, hollowed on top with short styles in the cavity.

Dry and intermediate regions; rare. Dambulla; Hanguranketa; Nilgala, Uva. Fl. Jan., Feb.; yellowish-green.

Endemic.

Leaves mottled with white in the centre.

8. PHYLLANTHUS, *L.*

Shrubs, rarely herbs or trees; l. usually small, distichous (except *P. hakgalensis*); fl. small, monœcious, apetalous, axillary; disk various; male fl.:—sep. 4–6, distinct, imbricate; stam. 3–5, fil. 0, or free, and more or less connate, anth. cells either parallel or divergent and dehiscence thus either parallei

or transverse; pistillode 0 (or very small in *Reidia*); fem. fl.:—sep. 5–6 (4 in *Prosorus*), ov. 3-celled, with 2 ovules in each cell (superposed in *Kirganelia*); styles 3, distinct or connate, usually bifid; fr. usually dry (rarely fleshy), usually with 3 crustaceous 2-seeded cocci; seeds trigonous, with fleshy endosperm.—Sp. 350; 56 in *Fl. B. Ind.*

Shrubs or herbs; sep. of fem. fl. 6 or 5 (No. 3 a tree).
  Sep. of male fl. 6 or 5.
    Stam. 5.
      All fil. connate; fr. dry (*Peltandra*) . 1. P. THWAITESIANUS.
      Two fil. distinct; fr. a berry (*Kirganelia*) . . . . 2. P. RETICULATUS.
    Stam. 3.
      Fr. large, fleshy (*Emblica*) . . . 3. P. EMBLICA.
      Fr. small, dry.
        Anth.-cells opening by vertical slits.
          Shrub . . . . 4. P. POLYPHYLLUS.
          Herbs
            Capsule glabrous.
              L. under ½ in. . . . . . 5. P. MADERASPATENSIS.
              L. over ¾ in. . . . . . 6. P. RHEEDII.
            Capsule muriculate . . . 7. P. URINARIA.
        Anth. with transverse dehiscence.
          Large shrub . . . . . . 8. P. MYRTIFOLIUS.
          Perennial herb . . . . . 9. P. SIMPLEX.
          Annual herbs.
            L. oblong-oval . . . . 10. P. NIRURI.
            L. rotundate . . . . 11. P. ROTUNDIFOLIUS.
  Sep. of male fl. 4 (*Reidia*).
    L. over 1 in. . . . . 12. P. BAILLONIANUS.
    L. under 1 in.
      Sep. fimbriate or toothed.
        L. crowded, narrowly oblong . . 13. P. ANABAPTIZATUS.
        L. not crowded, oval. . . . 14. P. OREOPHILUS.
      Sep. entire.
        Fruit glabrous.
          L. distichous . . . . . 15. P. LONGIFLORUS.
          L. not distichous . . . . 16. P. HAKGALENSIS.
        Fruit rough . . . . . . 17. P. CINEREUS.
        Fruit tomentose . . . . . 18. P. AFFINIS.
Deciduous trees; sep. 4 in both sexes (*Prosorus*).
  Male fl. minute; anth. short . . . 19. P. INDICUS.
  Male fl. ¼ in. diam., anth. long . . . 20. P. CYANOSPERMUS.

1. **P. Thwaitesianus,** *Muell. Arg. in DC. Prod.* xv. 2, 341 (1866). *Peltandra flexuosa*, Thw. Enum. 281. C. P. 3571.
Fl. B. Ind. v. 287. Wight, Ic. t. 1892 (*Peltandra parvifolia*).

A small, slightly branched shrub; branches very slender, angular, glabrous; l. varying in size, 1½–2 in. on stems, ½–1 in. on branchlets, on rather long petioles, broadly oval, acute at both ends, very thin, pale glaucous-green, usually mottled

with white along midrib and lat. veins, glabrous; stip. acicular; fl. very small, on long very slender ped., male in small clusters, fem. solitary; bracts fimbriate; sep. rounded; stam. 5, fil. connate half way; styles deeply bifid, spreading; fr. a dry capsule, very small, on long filiform stalk, glabrous.

Dry region; rare (?). Matale East; Bibile; Mineri; Anuradhapura. Fl. March–June; pale green.

Endemic.

The very much smaller size of the leaves on the ultimate twigs than those on the older branches gives a singular character to this little shrub. The leaves are sometimes mottled with white in the centre.

2. **P. reticulatus,** *Poir. Enc. Méth.* v. 298 (1804). **Wel-kayila,** *S.* **Pula, Pullanti, Mipullanti,** *T.*

Burm. Thes. 198. *Zizyphus lineatus*, Willd. Sp. Pl. i. 1102; Moon, Cat. 17. *P. multiflorus*, Willd.; Moon, Cat. 65. *P. microcarpus*, Muell. Arg. l.c. 343. *Kirganelia** *multiflora*, Baill.; Thw. Enum. 282. C. P. 2142, 327, 2947.

Fl. B. Ind. v. 288. Burm. Thes. t. 88. Wight, Ic. t. 1899 (*Anisonema multiflorum*).

A shrub, 8–10 ft.; branches lenticellate; shoots finely pubescent or glabrous; l. $\frac{3}{4}$–$1\frac{1}{2}$ in., on short petiole, variable, lanceolate or oblong-oval or nearly rotundate, obtuse or acute, rather thin, glabrous or slightly pubescent, somewhat paler beneath; stip. small, subulate, persistent; male fl. in clusters of 2–6; sep. very obtuse; stam. 5, the 3 inner fil. connate into a short column, the 2 outer free, shorter; fem. fl. solitary, sep. very obtuse, persistent; ov. 4–5-celled, stigmas very small; fr. about $\frac{1}{4}$ in., fleshy, depressed-globose, smooth and shining, purplish-black; seeds usually 10, 2 superposed in each cell.

Low country; very common in the dry region, rarer in the moist one. Fl. all the year; pink.

India, Malaya, Trop. Africa, China.

Burmann's figure is very good for the pubescent variety, which is the more frequent in the moist districts. The glabrous form (var. *glabra*, Thw.) has sometimes smaller fruit when it is *P. microcarpus*, Muell. Arg.

The little berries are purplish-black, and are sweetish to the taste. Affords a styptic gum. Plant also used medicinally as a diuretic. The twigs are used for tooth-brushes at Mannar.

3. **P. Emblica,**† *L. Sp. Pl.* 982 (1753). **Nelli,** *S.* **Toppinelli,** *T.*

Moon, Cat. 65. Thw. Enum. 282. C. P. 2144.

Fl. B. Ind. v. 289. Wight, Ic. t. 1896 (*Emblica officinalis*). Bedd. Fl. Sylv. t. 258.

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* *Kirganelia*, from Kirganeli, the Malabar name of *P. Niruri* as given by Rheede in Hort. Mal. x. 29.

† The fruit is the Emblic or Embelic myrobalan of the old pharmacists.

A small or middle-sized tree, rarely 30 ft. high, with a crooked trunk and spreading branches; bark thin, grey, with numerous bosses, whence arise the leaf-bearing branchlets; young parts pubescent; l. very numerous, closely placed, distichous, overlapping, spreading, nearly sessile, about ½ in., linear-strap-shaped, rounded at base, subacute, glabrous, paler beneath; stip. minute, acute; male fl. very small, numerous, on slender ped., in axillary fascicles; fem. fl. few, nearly sessile; male fl.:—sep. 6, oblong, obtuse, disk 0; stam. 3, connate throughout; fem. fl.:—sep. as in male; ov. surrounded by a cup-like lacerate disk, styles 3, large, spreading or recurved, dilated or lobed; fr. ½ in. or more, globose, fleshy, pale green or yellow, of 3 subdehiscent 2-seeded crustaceous cocci enclosed in a thick fleshy coat; seeds triquetrous, testa crustaceous, embryo with concave cotyledons.

Exposed places, especially on patana land in the moist region, up to 4000 ft.; very common. Fl. Oct.; greenish-yellow.

Throughout India, Malaya, China.

The feathery leafy branchlets precisely resemble pinnate leaves; they are deciduous, and the plant leafless in the dry season. The acid and astringent fruit is an important native medicine; it also makes a good preserve.

Hermann's drawing of his 'Kathukaramba' (Mus. 68), quoted by Linnæus for this species, seems rather to represent the foreign *P. longifolius* (*Cicca disticha*), which is often cultivated.

4. **P. polyphyllus,** *Willd. Sp. Pl.* iv. 586 (1805).
Thw. Enum. 282. *P. emblicoides*, Muell. Arg. l.c. 353. C. P. 2140 (2502).
Fl. B. Ind. v. 290. Wight, Ic. t. 1895, f. 2.

A shrub, or small tree; branches straight, terete; young parts striate, glabrous; l. very numerous, closely placed and often slightly overlapping, nearly sessile, small, under ½ in., linear-oblong, rounded at base, obtuse, mucronate, glabrous, veins rather prominent beneath; stip. minute, acute, persistent; fl. numerous, male 2 or 3 together, fem. much larger, solitary; stam. 3, anth. sessile, connate; ov. globose, styles connate for a short distance, bifid; fr. nearly ¼ in., dry, depressed, strongly 3-lobed, capped with persistent styles, glabrous but not shining.

Dry region; common. Fl. Nov., &c.

Also in S. India.

P. emblicoides, Muell. Arg., with a much thickened stylar column, seems to be based on an abnormal condition of that organ.

5. **P. maderaspatensis,** *L. Sp. Pl.* 982 (1753).
Moon, Cat. 65. Thw. Enum. 282. C. P. 2133.
Fl. B. Ind. v. 292. Wight, Ic. t. 1895, f. 3 (not good).

Annual, but sometimes slightly woody at base; stem 1–2 ft., erect, with long, slender, ascending, glabrous branches; l. on very short petioles, small, $\frac{1}{4}$–$\frac{1}{2}$ in., cuneate-obovate, much tapering to narrow base, rounded-truncate but often apiculate at apex, glaucous and with lat. veins conspicuous beneath; stip. linear-lanceolate, very acute; fl. on very short ped., male in small clusters, fem. solitary; sep. obovate-rotundate, obtuse; male fl.:—stam. completely connate; fem. fl.:—styles very small; fr. dry, very small, under $\frac{1}{8}$ in., depressed, 3-lobed, glabrous; seeds very finely muriculate in lines.

Dry region; rather common. Jaffna; Mineri, &c. Fl. Jan.–March.
India, Arabia, Trop. Africa, China, Java, Australia.

6. **P. Rheedii,** *Wight, Ic.* v. 2, 25 (1852).
P. flaccidus, Thw. Enum. 283. Muell. Arg. l.c. 363. C. P. 320.
Fl. B. Ind. v. 293. Wight, Ic. t. 1895, f. 1 (not good).

Annual; stem 1–2$\frac{1}{2}$ ft., rather stout, branched above, glabrous; l. $\frac{3}{4}$–1$\frac{1}{4}$ in., oblong-oval, acute or rounded at base, subacute and apiculate at apex, thin; petiole very short; stip. long, acicular, persistent; male fl. very small, on short ped. 1–3 together, fem. fl. much larger, solitary, on longer ped. thickened upwards; sep. oblong, obtuse, with white margins; fil. connate below; styles short, bifid; fr. $\frac{1}{6}$ in. diam., surrounded by persistent sep., globose, dry, scarcely 3-lobed, glabrous, almost membranous; seeds striate.

Montane zone, 4–7000 ft.; rather common. Fl. March, April.
Also in Nilghiri Mts.
Notwithstanding Wight's name, it is doubtful if Rheede's figure (Hort. Mal. ii. t. 27) really represents this plant.

7. **P. Urinaria,** *L. Sp. Pl.* 982 (1753). **Rat-pitawakká,** *S.*
Herm. Mus. 4. Burm. Thes. 231. Fl. Zeyl. n. 332. Moon, Cat. 65. Thw. Enum. 282. C. P. 2137.
Fl. B. Ind. v. 293. Wight, Ic. t. 1895, f. 4 (*P. leprocarpus*).

Annual; stem 1–2 ft., erect, very slightly branched, slender, glabrous; leaf-bearing branchlets short, flattened or slightly winged; l. numerous, closely placed, distichously imbricate, nearly sessile, small, $\frac{1}{4}$–$\frac{1}{3}$ in., oblong, rounded at base, apiculate, paler or silvery beneath; stip. peltate, very acute; fl. numerous, very minute, nearly sessile, solitary; sep. not enlarged in fr.; fr. very small, scarcely $\frac{1}{8}$ in., depressed-globose, scarcely lobed, muriculate; seeds transversely furrowed.

Waste ground in the low country; a common weed. Fl. all the year; yellowish.
Throughout the Tropics.
Very like *P. Niruri*, but easily distinguished by the muriculate fruit. A diuretic.

8. **P. myrtifolius,** *Moon, Cat.* 65 (1824). Thw. Enum. 283. *Macræa* myrtifolia*, Wight, Ic. v. 2, 27. C. P. 650.
Fl. B. Ind. v. 296. Wight, Ic. t. 1902, f. 2 (not good).

A large shrub, 8 ft. high, with very numerous irregular stems, and many slender, much-branched, elongated twigs; bark vertically fissured; young parts very finely pubescent; l. very numerous, spreading distichously (on the older branches usually with a suppressed branchlet bearing 2 or 3 l. in axil, forming a fascicle), $\frac{3}{8}$–$\frac{5}{8}$ in., lanceolate-linear, narrowed, but slightly sagittate at base, obtuse, glabrous, rather stiff; petiole very short; stip. minute, triangular, acute; fl. several from each l.-fascicle, on very slender pendulous filiform ped. $\frac{1}{4}$–$\frac{3}{4}$ in. long, male extremely numerous, fem. much fewer; male fl.:—sep. 6, ovate, subacute, glabrous, connivent; stam. 3, short; disk 6-lobed; fem. fl.:—sep. narrower and more acute; ov. glabrous, styles short, spreading; fr. small, $\frac{1}{8}$ in., depressed, slightly 3-lobed, smooth; seeds beautifully reticulate.

Moist region by streams, 1000–2000 ft.; rare. Near Kandy; Uma-oya; Dolosbagie. Fl. April, Sept., &c.; purplish-red or greenish. Endemic.

A very ornamental shrub when covered with the multitude of small pendulous flowers.

9. **P. simplex,** *Retz. Obs. Bot.* v. 29 (1789).
Thw. Enum. 282. *Macræa oblongifolia*, Wight, Ic. v. ii. 27. C. P. 2139.
Fl. B. Ind. v. 295. Wight, Ic. t. 1902, f. 1.

A perennial herb, often woody below, usually with a long tap-root and numerous elongated, slender, prostrate or ascending, slightly branched, compressed, glabrous stems; l. numerous, small, $\frac{1}{4}$–$\frac{1}{2}$ in., on very short petioles, closely placed and often overlapping, linear-oblong, obtuse, apiculate; stip. peltate, sagittate, brown, scarious; fl. usually solitary, on slender axillary ped., fem. larger; sep. oblong, obtuse; stam. 3, distinct; styles short, bifid; fr. very small, under $\frac{1}{8}$ in., on somewhat enlarged sep., globose, faintly 3-lobed, usually slightly rough with minute prominences; seeds minutely tubercled.

Var. β, **Gardnerianus,** *Muell. Arg. l. c.* 392. *Macræa Gardneriana*, Wight, Ic. v. ii, 27. *P. Gardneri*, Thw. Enum. 282. Wight, Ic. t. 1902, f. 3. C. P. 5, 178.

More robust, l. usually larger, fl. more numerous, fr. on longer ped., smooth.

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* Commemorates James Macrae, Superintendent of Peradeniya Gardens, 1827–30, an active collector, especially of orchids.

Low country; common. Var. β, montane zone, 3–7000 ft., on patanas; common. Fl. Jan.–Aug.

The type throughout Trop. Asia, var. β in S. India.

Var. β should perhaps be considered specifically distinct, as by Wight and Thwaites. It is sometimes pilose (var. *pubescens*, Thw.). At the higher elevations occurs a form with very small, stiff, rotundate leaves.

A very variable plant in habit. The leaves readily disarticulate, and the lower parts of the stems are usually bare.

10. **P. Niruri,*** *L. Sp. Pl.* 981 (1753). **Pitawakka,** *S.* **Kilkáynelli,** *T.*

Herm. Mus. 11. Burm. Thes. 230. Moon, Cat. 65. Thw. Enum. 282. C. P. 2136, 2138.

Fl. B. Ind. v. 298. Burm. Thes. t. 93, f. 2. Wight, Ic. t. 1894.

Annual herb, 1–2 ft.; stem often branched at base, angular, glabrous; l.-bearing branchlets slender, spreading; l. numerous, crowded, distichous, somewhat imbricated, spreading, nearly sessile, $\frac{1}{2}$–$\frac{3}{4}$ in., oblong-oval, obtuse, thin, pale beneath; stip. very acute; male fl. very minute, often 2 or 3 together, fem. much larger, solitary; male fl.:—sep. rounded; stam. 3; fem. fl.:—sep. oval, subacute, with broad white margins; fr. very small, $\frac{1}{16}$–$\frac{1}{12}$ in., depressed-globose, faintly 3-lobed, quite smooth; seeds with slender ribs.

Low country, in waste and cultivated ground; a common weed. Fl. all the year; yellowish.

Tropics generally, except in Australia.

A diuretic.

11. **P. rotundifolius,** *Klein in Willd. Sp. Pl.* iv. 584 (1805).

Thw. Enum. 282. C. P. 2134.

Fl. B. Ind. v. 299.

Annual, with a long tap-root; stems numerous, prostrate, long, spreading, rigid, branched, glabrous; l. very small, $\frac{1}{6}$–$\frac{1}{3}$ in., on short petioles, more or less rotundate, often apiculate, thick, veins not visible, glaucous; stip. lanceolate, acuminate; fl. solitary, on very short ped., male minute, fem. larger; sep. broadly oblong, obtuse, with broad white margins; fr. very small, about $\frac{1}{10}$ in., depressed-globose, scarcely 3-lobed, glabrous; seeds with slender ribs.

Sandy seashores; very rare. Batticaloa (Gardner); Trincomalie (Glenie). Fl. March, &c.

India, Arabia, Trop. Africa.

12. **P. Baillonianus,** *Muell. Arg. in Linnæa,* xxxii. 47 (1863).

Epistylium latifolium, Thw. Enum. 283 (excl. Syn.). *E. cordifolium*, Baill. Ét. Euph. 648.

Fl. B. Ind. v. 300.

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* Linnæus took this from a W. Indian name for the plant.

A shrub, 2–4 ft., much branched; bark pale brown; young parts glabrous; l. numerous, large, $1\frac{1}{4}$–$2\frac{1}{2}$ in., on very short petioles, ovate or ovate-lanceolate, rounded or subcordate at base, attenuate, acute, rather thick, lat. veins wide-spreading, reticulate, conspicuous; stip. long, very acuminate; male fl. very small, solitary or in small clusters, on filiform ped., fem. fl. much larger, on very long ped. thickened upwards, in very lax terminal racemes; bracts acicular; male fl.:—sep. 4, rotundate, entire; disk of 2 large uniform scales; stam. 4, fil. connate below into a short thick column, anth.-cells confluent with transverse dehiscence; fem. fl.:—sep, 6, oblong-oval, obtuse, entire; disk large, dilated, 6-lobed; styles spreading, bifid; fr. $\frac{1}{4}$ in., nearly globose, dry, smooth, cocci 2-seeded; seeds $\frac{1}{8}$ in. long.

Moist region, 1–4000 ft.; rather rare. Hunasgiriya; Hewaheta; Ambagamuwa; Hiniduma. Fl. March, April, Aug.; pale red.
Endemic.

A very well-marked species, easily recognised by its large ovate leaves, pale and reticulately veined with white or purple beneath.

Thwaites, by an oversight, refers Wight, Ic. t. 1904, f. 2 (*Reidia latifolia*) to this, which represents a very different plant.

13. **P. anabaptizatus,** *Muell. Arg. in DC. Prod.* xv. 2, 421 (1866).
Epistylium zeylanicum, Baill. Ét. Euph. 648. *E. polyphyllum*, Thw. Enum. 283. *Reidia polyphylla*, Wight, Ic. v. ii. 28. C. P. 432.
Fl. B. Ind. v. 302. Wight, Ic. t. 1904, f. 4.

A shrub, 3 or 4 ft., with straight branches; bark dark brown; branchlets very numerous, closely placed; l. small, very numerous, closely inserted and overlapping, nearly sessile, $\frac{3}{8}$–$\frac{1}{2}$ in. long, narrowly lanceolate-oblong, often slightly falcate and oblique, obtuse or acute, glaucous beneath; stip. acicular, persistent, conspicuous; fl. numerous, male often in short bracteated axillary racemes, fem. solitary on ped. much exceeding l., mostly at ends of branchlets; male fl.:—sep. 4, roundish, fimbriate; disk of 4 roundish glands; stam. 4, connate, anth. with transverse dehiscence; fem. fl.:—sep. 6, broadly oval, fimbriate; disk annular, slightly crenate; styles stout, deeply cleft; fr. very small, $\frac{1}{8}$ in., 3-lobed, glabrous.

Montane zone; very rare. Banks of stream at Sita-gangula near Adam's Peak, at 5000 ft. (Thwaites). Fl. Feb.; reddish.
Endemic.

14. **P. oreophilus,** *Muell. Arg. in Linnæa*, xxxii. 49 (1863).
Epistylium montanum, Thw. Enum. 283. *E. polyphyllum*, var., Thw. l. c. 428. C. P. 2148.
Fl. B. Ind. v. 303.

A shrub, 3–4 ft., young parts glabrous; l. $\frac{1}{4}$–$\frac{5}{8}$ in., on short petioles, rather close but not overlapping, oval, slightly oblique, obtuse at both ends, apiculate, thin, paler beneath; male fl. on filiform ped. longer than l., fem. larger, on longer ped. at upper ends of branchlets; male fl.:—sep. 4, oval, fimbriate or toothed; disk of 4 glands; anth. dehiscing transversely; fem. fl.:—sep. 6, as in male; disk expanded, slightly lobed; fr. $\frac{1}{8}$ in., smooth, cocci thinly crustaceous.

Upper montane zone; rare. Horton Plains; Uva Prov. Fl. Feb. Endemic.

15. **P. longiflorus,** *Heyne in Wall. Cat.* n. 2905 (1828).
Fl. B. Ind. v. 302 (not given for Ceylon).

A shrub; branchlets numerous, crowded at upper ends of stems, quite glabrous; l. $\frac{3}{4}$–1 in., very distichous, oblong-lanceolate, unequal-sided, somewhat falcate, acute, rather thick, paler beneath, but glabrous; stip. subulate, persistent; male fl. very small, on short ped.; sep. 4, oval, obtuse, entire; disk of 4 rounded glands; fem. fl. much larger, sep. 6, as in male; fr. $\frac{1}{4}$ in., globose, smooth and shining.

Low country; very rare. On Doluwe Kande, Four Korales Dist. Fl. Dec.

Also in S. India and Malay Peninsula.

My specimens are imperfect, and I cannot feel certain of the name. The plant has much resemblance to *P. pulcher*, Wall., but the sep. are not laciniate. Dries a dull greyish-brown.

16. **P. hakgalensis,** *Thw. ex Trim. in Journ. Bot.* xxiii. 242 (1885), (misprinted *Uakgalensis*).
Trim. Syst. Cat. Ceyl. Pl. 80. C. P. 4015.
Fl. B. Ind. v. 291.

A small shrub, with many short slender branches, young parts glabrous; l. crowded, not distichous, numerous, small, under $\frac{1}{2}$ in., oblong-linear, nearly sessile, tapering to base, acute at apex, not falcate or oblique; stip. subfalcate, very acute, persistent; fl. solitary on ped. nearly as long as l., fem. twice size of male; male fl.:—sep. 4., $\frac{1}{8}$ in., broadly oval or rounded, very obtuse, entire, glabrous; disk of 6 glands; stam. 4, fil. connate; fem. fl.:—sep. 6, $\frac{1}{4}$ in., as in male; disk pulvinate; fr. globose, $\frac{1}{4}$ in., quite smooth, enclosed in the enlarged calyx.

Montane zone; very rare. I have only seen the C. P. specimens which were presumably collected at Hakgala. Fl. (?)

Endemic.

The Fl. B. Ind. places this in sect. *Paraphyllanthus;* it seems to come rather under *Reidia*, but my material is very scanty. The scattered, not distichous, leaves are remarkable; they are copiously dotted beneath.

17. **P. cinereus,** *Muell. Arg. in Linnæa*, xxxii. 48 (1863).
Epistylium floribundum, Thw. Enum. 283 (part). C. P. 2531, 3872.
Fl. B. Ind. v. 303.

A bush; bark brown, rough with scars of numerous leaf-branchlets, which are crowded at ends of branches; young parts pubescent or glabrous; l. numerous, on very short petioles, ½–¾ in., broadly oval-oblong or oblong-orbicular, very unequal-sided, apiculate, rather thin, paler and often pubescent beneath; fl. solitary, drooping, on slender ped., fem. much larger than male, on much longer ped. thickened upwards, on upper part of branchlets; male fl.:—sep. 4, broadly ovate, entire; disk of 4 large orbicular glands; stam. 4, anth. sessile, with transverse dehiscence; fem. fl.:—sep. 6, oval, obtuse; ov. hairy, styles short, deeply bifid; fr. erect, under ¼ in., depressed, rough, with minute prominences; seeds quite smooth.

Montane zone; rather rare. Maturata; Wattakelle Hill. Fl. Feb.–Sept.; red.

Endemic.

The branchlets and under surface of leaves vary in amount of pubescence, they are often quite glabrous.

18. **P. affinis,** *Muell. Arg. in Linnæa*, xxxii. 48 (1863).
Epistylium floribundum, Thw. Enum. 283 (part). C. P. 71.
Fl. B. Ind. v. 304.

A bush; leafy branchlets numerous, crowded near summit of stems, more or less pubescent; l. numerous, on very short petioles, ½–¾ in., or rather more, broadly oval-oblong, very unequal-sided, apiculate, slightly pubescent above, strongly so and pale beneath; stip. linear, long-pointed, persistent; male fl. not seen, 'minute solitary' axillary; 'sep. rounded, obscurely toothed;' disk glands large, lobulate; fem. fl. on slender ped. thickened upwards and longer than l.; fruit ⅓ in., covered with a dense tomentum of branched processes; seeds smooth.

Montane zone; very rare. Galagama (Gardner).

Endemic.

Very near the last, with which Thwaites combined it. When dried, leaves become nearly black on upper surface, pale yellow beneath.

P. longifolius, Jacq. (*Cicca disticha*, L.), is a bush or small tree much grown in native gardens for its acid fruit, under the names 'Rata-nelli' or 'Siri-nelli,' and no doubt an ancient cultivation. It is the 'Nelli' of Herm. Mus. 55, and therefore Fl. Zeyl. n. 179 (and the *Averrhoa acida* of Linnæus); but there is no specimen in Herb. Herm., and the drawing is by no means characteristic. Rheede's figures (Hort. Mal. iii. tt. 47, 48) are good. Probably originally a Malayan plant.

19. **P. indicus,** *Muell. Arg. in Linnæa*, xxxii. 52 (1863). **Karawu,** *S.*

Prosorus indica, Dalz.; Thw. in Kew Journ. Bot. vi. 299, and Enum. 281. C. P. 2155 (3099).

Fl. B. Ind. v. 305. Kew Journ. Bot. vi. t. x. C. f. 3–6 (P. indica).

A deciduous tree, 30–40 ft., much branched; bark whitish; young parts glabrous; l. 2–4 in., on slender petioles, lanceolate or oval, acute at base, subacute at apex, apiculate, glabrous, thin, glaucous beneath; stip. small, membranous, deciduous; fl. small, on long ped., in axillary umbellate clusters at base of annual growth; male fl. more numerous, minute; sep. 4, oblong, truncate, reflexed; disk annular, fleshy, large; stam. 4, distinct, fil. long, anth. short, extrorse; fem. fl.:—sep. as in male; disk smaller; ov. globose, styles large, bifid, reflexed; fr. globose, over $\frac{1}{4}$ in., faintly 3-lobed, smooth, green, pericarp thin; seeds 2 in each coccus, irregularly triquetrous, blue, surrounded with an aril.

Low country, up to 2000 ft., chiefly in the moist region; rather common. Pasdun Korale; Deltota; Uma-oya; Topare. Fl. April.

Also in S. India.

Wood white, tough; useful for building purposes.

20. **P. cyanospermus,** *Muell, Arg. in Linnæa*, xxxii. 51 (1863). **Sudu-Uijaṉ, Kulu-niyaṉ,** *S.*

Croton cyanospermus, Gaertn. Fruct. ii. 120. *Zygospermum zeylanicum*, Thw. ex. Baill. Ét. Euph. 619. *Prosorus Gaertneri*, Thw. in Kew Journ. Bot. viii. 272. *Prosorus cyanosperma*, Thw. Enum. 281. C. P. 2601 (2155 part).

Fl. B. Ind. v. 305. Kew Journ. Bot. vi. t. 10, C. f. 1, 2, 7–10 (*P. Gaertneri*). Gaertn. Fruct. t. 107 (*Croton cyanospermus*).

A deciduous tree, precisely like *P. indicus* in foliage; fl. on long ped. at base of annual growth, male in small umbellate clusters, fem. solitary, often axillary; male fl. much larger than in *P. indicus;* sep. 4, oblong, very obtuse; stam. 4, fil. short, anth. long linear; fem. fl.:—sep. 4, rounded, very obtuse; ov. glabrous, styles large, reflexed; fr. $\frac{3}{8}$ in., nearly globose, smooth, brown; seeds coherent in pairs in each coccus, covered with an arillus of a deep brilliant metallic blue.

Moist region, below 1000 ft.; rare. Ambagamuwa Dist.; Karawita, near Ratnapura. Fl. March, April.

Endemic.

Very near *P. indicus*, but distinguished readily by the natives. The seeds are a splendid metallic blue.

9. GLOCHIDION, *Forst.*

Trees or shrubs; l. rather large, numerous, distichous, with stip.; fl. monœcious (rarely diœcious), apetalous, axillary, usually in clusters; male fl.:—sep. 6 (rarely 5), imbricate; stam. 3–8, connate; no disk; fem. fl.:—sep. 6 (rarely connate into a cal.); no disk; ov. 3–15-celled, styles connate into a globose, conical, clavate or columnar erect body, which increases in size after fertilisation, ovules 2 in each cell; fr. depressed-globose, crowned by the enlarged style, 3- or 6-lobed, with two seeds in each coriaceous or crustaceous coccus; seeds hemispheric or laterally compressed, testa crustaceous with often a succulent coat, endosperm fleshy, cotyledons flat.—Sp. 120; 57 in *Fl. B. Ind.*

Stam. 5 or 6	1. G. ZEYLANICUM.
Stam. 4 (rarely 3); styles globose . . .	2. G. BRACHYLOBUM.
Stam. 3; styles elongated.	
Cal. of fem. with 5 or 6 segm.	3. G. PYCNOCARPUM.
Cal. of fem. of 6 distinct sep.	
Styles not twice as long as sep. . . .	4. G. RIGIDUM.
Styles twice as long as sep., or longer.	
Ped. and cal. glabrous.	
L. obtuse, coriaceous	5. G. CORIACEUM.
L. acute, narrowly lanceolate . . .	6. G. NEMORALE.
Ped. and cal. hairy.	
L. glabrous	7. G. GARDNERI.
L. hairy beneath.	
Capsule glabrous or nearly . . .	8. G. MONTANUM.
Capsule pubescent	9. G. MOONII.

In the 'Genera Plantarum' and in Muell. Arg.'s monograph, this is reduced to a section of *Phyllanthus*, and in my 'Cat. Ceyl. Pl.' I followed these authorities in so treating it. In 'Fl. B. Ind.,' Sir J. Hooker has restored it to rank as a genus on very good grounds.

A characteristic genus of our wet forests; all the species but one are endemic.

1. **G. zeylanicum,** *A. Juss. Tent. Euphorb.* 107 (1824). **Hunukirilla,** *S.*

Bradleia zeylanica, Gaertn. Fruct. ii. 128. Thw. Enum. 285. C. P. 2149.

Fl. B. Ind. v. 310. Gaertn. Fruct. ii. t. 109 (fruit only).

Tree; bark rather smooth, brownish-grey; young parts glabrous; l. rather large, 4–6 in., oval-oblong, sometimes rather unequal-sided, rounded or slightly subcordate at base, obtuse, glabrous on both sides, rather thick, bright apple-green, paler beneath; petiole very short; stip. triangular, very acute, recurved; fl. shortly stalked, male and fem. together in

umbellate clusters, fem. more numerous; sep. oblong-roundish, obtuse; anth. 5 or 6; styles connate into a short pointed cone; fr. $\frac{3}{5}$ in., much depressed, very obscurely lobed, tipped with short styles, glabrous, cocci 5–8, orange, shining, epicarp usually deciduous.

Var. β, **tomentosum,** *Trim. Cat. Ceyl. Pl.* 79. C. P. 3432.

Branchlets, l. beneath, and fruit finely tomentose.

Moist low country, up to 2000 ft.; common. Var. β, Kukul and Reigam Korales. Fl. Dec.–April, July; pale green.

Also in India and Malaya.

A very variable plant.

[*G. littorale*, Bl. is given for Ceylon on the authority of Wight in Fl. B. Ind. v. 308. I have been unable to find a specimen at Kew.]

2. **G. brachylobum,** *Muell. Arg. in Linnæa*, xxxii. 62 (1863).
G. coriaceum, Thw. Enum. 285 (part). C. P. 3016.
Fl. B. Ind. v. 313.

Small tree; bark whitish; young parts glabrous; l. 3–5 in., ovate-oval, on short petioles, unequal at base, obtuse or sub-acute, glabrous, coriaceous; stip. triangular, acute, stiff; fl. few, male and fem. from same axils, fem. on very short ped.; cal. cup-shaped, with 4–6 shallow lobes longer in male; anth. 4 (or 3); styles connate into a globose head; fr. $\frac{3}{8}$ in. or less, depressed, obscurely 5–6-lobed, glabrous; epicarp thick, not deciduous.

Moist region in lower montane zone; rather rare. Ambagamuwa. Fl. March.

Endemic.

3. **G. pycnocarpum,** *Bedd. For. Man.* 194 (1873?).
G. coriaceum, Thw. Enum. 285 (part). *Phyllanthus pycnocarpus*, Muell. Arg. in DC. Prod. l.c. 304. C. P. 2529.
Fl. B. Ind. v. 315.

Small tree; bark yellowish; young parts glabrous; l. $2\frac{1}{4}$–$3\frac{1}{2}$ in., on short petioles, unequal-sided, the larger side rounded or subcordate at base, the smaller side acute, lanceolate, acuminate, acute, glabrous; fl. few, male on slender ped., fem. sessile, often solitary; male fl.:—sep. 5, lanceolate, acute; anth. 3; fem. fl.:—cal.-segm. 5 or 6, as long as tube, acute; style very large and stout, twice as long as ov., and much exserted, with 3 deep erect lobes; fr. small, about $\frac{1}{4}$ in., 3–6-lobed, crowned with the very stout style, glabrous.

Var. β, **elliptica,** *Hk. f. in Fl. B. Ind.* v. 316. C. P. 2560.

L. smaller, $1\frac{1}{2}$–$2\frac{1}{2}$ in., less unequal-sided, acute at base, obtuse at apex; capsule larger, $\frac{1}{3}$ in. or more.

Lower montane zone; rather rare (?). Hunasgiriya. Fl. Sept.
Endemic.
Dries nearly black. Thwaites considered var. β to be a variety of *G. rigidum.*

4. **G. rigidum,** *Muell. Arg. in Linnæa*, xxxii. 67 (1863).
Phyllanthus stellatus, Retz. Obs. Bot. v. 29; Moon, Cat. 65. *Gynoon rigidum*, A. Juss. Tent. Euphorb. 107. *G. Jussieuianum*, Wight, Ic. v. 2, 29. *Glochidion Jussieuianum*, Thw. Enum. 285. *G. Thwaitesii*, Muell. Arg. in Linn. l. c. 66. *Phyllanthus Jussieuianus*, Muell. Arg. in DC. Prod. l. c. 304. C. P. 2561.
Fl. B. Ind. v. 320. Wight, Ic. t. 1908 (*Gynoon triandrum*).

Bush or small tree; bark pale, lenticellate; young parts glabrous; l. 2–$4\frac{1}{2}$ in., lanceolate, acute at both ends, sometimes slightly unequal-sided and falcate, glabrous, stiff, on very short petioles; fl. on slender ped. longer in male; male fl.:—sep. 6, linear-lanceolate; anth. 3; fem. fl.:—sep. 6, lanceolate, acute, style very stout, 3 times as long as ov., slightly exserted, deeply 3-lobed; fr. small, $\frac{1}{4}$–$\frac{1}{3}$ in., depressed, capped with the short stout style 3- (6-) lobed, glabrous.

Low country in both regions, and up to 4000 ft.; common. Fl. Jan.–March; yellowish.
Endemic.
Koenig's specimens of *P. stellatus*, Retz. are in Brit. Mus. 1, and are without doubt this plant. *P. Jussieuanus*, kept distinct by Muell. Arg., scarcely differs.

5. **G. coriaceum,** *Thw. Enum.* 285 (in part) (1861).
Phyllanthus coriaceus, Muell. Arg. in DC. Prod. l. c. 304. C. P. 342.
Fl. B. Ind. v. 321.

A shrub or small tree; branchlets angular, glabrous, or slightly pubescent; l. $2\frac{1}{2}$–6 in., variable, from lanceolate to broadly oval, acute or rounded at base, shortly acuminate or rounded, obtuse at apex, coriaceous, venation prominent beneath; stip. triangular, very acute, stiff, persistent; fl. in dense fascicles, male on glabrous ped., fem. sessile; sep. oblong, obtuse, thick; style stout, twice as long as sep., faintly 3-lobed, glabrous; fr. fully $\frac{1}{3}$ in., depressed, strongly lobed, crowned with long, often curved cylindric, style from its sunken top.

Montane zone; rather rare. Hakgala; Hewaheta; Ambagamuwa. Fl. March.
Endemic.
Usually dries coppery-brown. Style sometimes deciduous in fruit.

6. **G. nemorale,** *Thw. Enum.* 286 (1861).
Phyllanthus nemoralis, Muell. Arg. in DC. Prod. l. c. 312. C. P. 3015. Fl. B. Ind. v. 324.

Tree; branchlets long, angular, glabrous, or slightly pilose; l. large, 4½–7 in., narrowly lanceolate, narrowed or rounded at base, acuminate, acute, glabrous, lat. veins very oblique, prominent, sometimes pilose beneath, on very short petioles; fl. numerous, in large clusters, on slender pilose ped. longer than petioles; sep. oblong, acute; style very long, 3 times length of sep., cylindrical, slightly clavate, very shortly 3-fid, glabrous; fr. ⅜ in., much depressed, 3-lobed, capped with long, stout, columnar style, glabrous.

Moist region, below 1000 ft.; very rare. Pasdun Korale; Kuruwita. Fl. Dec.
Endemic.
The very oblique prominent lat. veins well distinguish this species, as well as the long style.

7. **G. Gardneri,** *Thw. Enum.* 286 (1861).
Phyllanthus leptogynus, Muell. Arg. in DC. l. c. 312. *G. leptogynum*, Bedd. For. Man. 195. C. P. 3156.
Fl. B. Ind. v. 325.

Small tree or shrub; branchlets slender, angular, glabrous; l. 1½–3 in., oval, tapering at base into short petiole, scarcely unequal-sided, shortly acuminate, apiculate, glabrous; fl. in small clusters, slender in male, short and pilose in fem.; sep. narrowly oblong, reflexed in male, hairy; style very slender, more than twice as long as sep., 3-toothed; fr. ½ in., much depressed, 6-lobed, smooth, crowned with the long slender style, cocci orange-red.

Var. β, *Thw.* **acuminata,** *Trim.*

L. larger, 2½–5 in., lanceolate, often very unequal at base and falcate, very acuminate.

Moist region, the type from 'Central Province, Gardner.' Var. β below 1000 ft.; rather common. Pasdun Korale; Reigam Korale; Wattegulle, Deyandera, &c., S. Prov. Fl. March, Sept.; yellow.
Endemic.
Var. β is much the commoner plant; indeed, the only specimens of the type I have are from the Botanic Gardens. It is probably a distinct species. The type dries black.

8. **G. montanum,** *Thw. Enum.* 286 (1861).
Phyllanthus symplocoides, Muell. Arg. in DC. l. c. 311. *G. symplocoides*, Bedd. For. Man. 195. C. P. 3133.
Fl. B. Ind. v. 325.

Small tree, 15–20 ft.; branchlets more or less tomentose; l. rather small, 1½–3 in., on short tomentose petioles, oblong-oval, generally unequal-sided, usually rounded at base, obtuse or subacute, apiculate, rather coriaceous, glabrous above, more or less pubescent beneath, and often somewhat glaucous; fl. in small clusters, male on long pubescent ped., fem. sessile; sep. more or less hairy; style stout, 2 or 3 times as long as sep., hairy; fr. ⅓ in., depressed, strongly 3-lobed, crowned by the long style, usually glabrous.

Lower montane zone, 3–4000 ft.; rare. Atampitiya, Uva; Passara, Uva; Bilahul-oya-Balangoda. Fl. Feb.–April.

Endemic.

I have not noticed the style to be so long as given in Fl. B. Ind. The capsules are sometimes slightly pubescent.

9. **G. Moonii,** *Thw. Enum.* 286 (1861). **Be-hunukirilla,** *S.*

Phyllanthus pubescens, Moon, Cat. 65. *P. Moonii* and *P. glaucogynus*, Muell. Arg. in DC. Prod. l.c. 312. *Gynoon hirsutum*, Wight, Ic. v. 2, 29. C. P. 2150, 258, 68.

Fl. B. Ind. v. 325. Wight, Ic. t. 1909 (*Gynoon hirsutum*).

Shrub or small tree; branches more or less pubescent or tomentose; young parts often very tomentose; l. varying in size, 2–7 in., on short hairy petiole, lanceolate or oval, acute at base, acuminate, acute, hairy on both sides, especially beneath (rarely glabrous above), conspicuously reticulate-veined; stip. large, falcate-lanceolate, acute; fl. numerous, male on long hairy ped., fem. nearly sessile; sep. oblong, acute, reflexed in male; pet. 2 and 3 times as long as sep., 3-cleft, hairy; style slender; fr. nearly ½ in., strongly 3-lobed, topped by the long style, pubescent.

Moist region, up to 4000 ft.; rather common. Hewesse; Ambagamuwa; Sabaragamuwa; Morowak Korale; Hantane; Maturata; Adam's Peak. Fl. Jan.–March; pale yellow.

Endemic.

Very variable in amount of hairiness; C. P. 68, from Maturata, has the leaves and stems nearly glabrous (var. *subglabra*, Trim. Cat. Ceyl. Pl. 79). *P. glaucogynus*, Muell. Arg. (var. *glaucogyna*, Trim. l. c.), C. P. 2150, has broader leaves and a longer style.

10. FLUEGGEA, *Willd.*

Spiny shrub; l. alt., small, distichous; fl. minute apetalous, diœcious; male fl.:—sep. 5, distinct, imbricate in bud; disk glands 5; stam. 5, fil. distinct, anth. erect; pistillode large; fem. fl.:—sep. as in male; disk annular; ov. usually 3-celled, with 2 ovules in each cell, styles rather long, recurved, bifid;

fr. a small globose berry; seeds usually 6, testa bony, endosperm scanty, embryo curved, cotyledons flat.—Sp. 6; 2 in *Fl. B. Ind.*

F. leucopyrus, *Willd. Sp. Pl.* iv. 757 (1805). **Hin-katupila,** *S.* **Mudpulänti,** *T.*
Flacourtia nivea, Moon, Cat. 70. Thw. Enum. 281. C. P. 2154.
Fl. B. Ind. v. 329. Wight, Ic. t. 1875.

Large bush, with long straggling branches; leafy twigs horizontal, divaricate, rigid, usually ending in sharp spines; bark white or grey; l. small, ½–1 in., obovate, obcordate, or rotundate, on short petioles, glabrous, entire, glaucous beneath; fl. pedicellate, in axillary clusters, fem. fewer than male; sep. obtuse; stam. much exserted; berry about ¼ in., globose, smooth, quite white when ripe, 3-celled.

Dry country; common. Fl. June, Aug.; green.
Also in Peninsular India.
Easily recognised by its little white berries; a very rigid thorny shrub.

F. microcarpa, Bl., which differs in being unarmed and with larger but narrower leaves, is given for 'Ceylon, *Kelaart,*' in Fl. B. Ind. It is a common plant in the Tropics of the Old World. I searched in vain in Herb. Kew for a specimen.

11. BREYNIA, *Forst.*

Small trees or shrubs, with spreading branches, l. small, distichous, stipulate; fl. very small, apetalous, axillary, monœcious; male fl.:—cal. very shortly 6-lobed; lobes inflected; disk 0; stam. 3, fil. connate in a central column, anth.-cells linear; pistillode 0; fem. fl.:—cal. more deeply 6-lobed, ov. 3-celled, with 2 ovules in each cell, styles 3, short, bifid, or stigmas 3; fr. small, fleshy, dehiscent or not, seated on cal., nearly globose; seeds 6, trigonous with rounded back, testa crustaceous or bony, cotyledons broad, flat, endosperm fleshy.—Sp. 12; 6 in *Fl. B. Ind.*

Cal. greatly enlarged in fruit	1. B. PATENS.
Cal. not enlarged	2. B. RHAMNOIDES.

1. **B. patens,** *Hk. f. in Fl. B. Ind.* v. 329 (1887). **Wal-murunga,** *S.*
Phyllanthus pomacea, Moon, Cat. 65. *Melanthesa turbinata,* Wight, Ic. v. ii. 26; Thw. Enum. 285. *Melanthesopsis patens,* Muell. Arg. l. c. 437. C. P. 2143.
Fl. B. Ind. v. 329. Wight, Ic. t. 1897 (*Melanthesa truncata*).

A much-branched bush; twigs slender, angular, glabrous; bark smooth, grey; l. numerous, distichous, on short petioles, ½–1 in., rotundate-oval, often slightly emarginate, entire, glabrous, glaucous, paler beneath, thin; stip. small, triangular, persistent; fl. with the young l. few, solitary, on slender ped.; the lower ones male, drooping; the upper female, erect, smaller; male fl.:—cal. turbinate, bell-shaped, truncate, or very faintly lobed; anth. adnate to column; fem. fl.:—cal.-segm. deep, rounded, in two series, styles 3, bifid; fr. globose-depressed, faintly 3-lobed, supported on the greatly enlarged, flattened cal., pericarp thick, orange-red, fleshy, but dehiscent into 3 valves; seeds 6, triquetrous, each nearly, or quite, covered with an orange-yellow aril, testa perforate at the hilum.

Low country in both moist and dry regions, to 3000 ft.; common. Fl. April–June; male lemon-yellow, fem. pale green.

Also in India and Burma.

Has an alliaceous scent; the fruit is orange-red when ripe, and dehiscent though fleshy.

2. **B. rhamnoides,** *Muell. Arg. in DC. Prod.* xv. 2, 440 (1866).
Gas-kayila, *S.* **Manipulnáti,** *T.*

Phyllanthus rhamnoides Willd.; Moon, Cat. 65. *Melanthesa rhamnoides*, Bl.; Thw. Enum. 285. C. 2141.

Fl. B. Ind. v. 339. Wight, Ic. t. 1898, f. 1 (*Phyllanthus rhamnoides*).

A small tree or bush, with many long horizontal branches; bark yellowish-grey; twigs angular, glabrous; l. numerous, distichous, spreading, on short petioles, 1–1½ in., oval, acute at both ends, entire, glabrous, thin, pale beneath, veins inconspicuous; stip. minute, subulate; fl. on slender ped., male very small, in clusters, fem. solitary; male fl.:—cal. turbinate, segm. short, obtuse, inflexed, nearly closing the mouth; stam.-column short; fem. fl.:—cal. cup-shaped, segm. acute; ov. much exserted, oblong, truncate, styles very short; fr. small, globose, ⅛ in., seated on the scarcely enlarged cal., smooth, dull red; seeds ⅛ in., aril 0, testa imperforate except at the very base.

Low country in the moist region, to 3000 ft.; common. Fl. July; yellow.

India, Burma, China, Malaya, Philippine Is.

Dries nearly black.

12. **PUTRANJIVA,*** *Wall.*

Trees; fl. small, in axillary clusters; apetalous, usually diœcious; male fl.:—cal. deeply cut into 3–6 segm., or of 2

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* From the Sanskrit name (see Roxb. Fl. Ind. iii. 766).

distinct imbricate sep.; disk 0; stam. 2 or 3, distinct; pistillode 0; fem. fl.:—sep. 4–6; disk 0; ov. 2- or 3-celled, with 2 ovules in each cell, styles 2 or 3, stigmas short, spreading, broadly dilated; fr. a drupe, with a hard thin endocarp, 1-celled by abortion; seed solitary, testa crustaceous, embryo with foliaceous cotyledons, in axis of copious endosperm.—The only 2 species.

Sep. of fem. fl. 5–6; fr. globose . . . . . 1. P. ROXBURGHII.
Sep. of fem. fl. 4; fr. pointed . . . . 2. P. ZEYLANICA.

1. **P. Roxburghii,** *Wall. Tent. Fl. Nep.* 61 (1826). **Vitchurunai, Karippalai,** *T.*
Thw. Enum. 287. *P. sphærocarpa*, Muell. Arg. l. c. 443. C. P. 2122.
Fl. B. Ind. v. 336. Wight, Ic. t. 1876. Bedd. Fl. Sylv. t. 275.

A moderate-sized tree; bark whitish; buds pubescent; l. 2½–3½ in., oval or lanceolate or oblong-lanceolate, acute and unequal at base, shortly acuminate, faintly serrate, glabrous; male fl. sessile, crowded in rounded clusters on a very short axillary peduncle, fem. fl. solitary or in pairs; male fl.:—cal.-segm. acute; stam. 3, fil. short, anth. globose; fem. fl.:—sep. 5–6, small, oval, subacute, ciliate; ov. flask-shaped, finely silky, 3-celled, styles 3, recurved, stigmas large, flabellate; drupe nearly ½ in., globose, not pointed, densely finely tomentose, pale green, stone hard, wrinkled.

Dry region; rare. Haragama; Kondesale; Minneri. Fl. Feb.; green.
Also India and Burma.

2. **P. zeylanica,** *Muell. Arg. in DC. Prod.* xv. 2, 444 (1866). **Pelan,** *S.*
*Palenga** *zeylanica*, Thw. in Kew Journ. Bot. viii. 271; Enum. 287. C. P. 3349.
Fl. B. Ind. v. 337. Kew Journ. Bot. viii. t. 7, f. C.

A tree, 40–50 ft.; bark pale, smooth; young part glabrous; l. 3½–4½ in., on short glabrous petioles, oval-lanceolate, acute, nearly equal at base, caudate-acuminate, slightly undulate, but scarcely serrate at margin, rather coriaceous, glabrous, and shining; fl. shortly pedicellate, the male numerous, the fem. 1–3 together; male fl.:—sep. 2, obtuse, slightly ciliate; stam. 2; fem. fl.:—sep. 4, rotundate, obtuse, slightly ciliate; ov. as long as sep., densely pubescent, 2-celled, stigmas 2, flat, sessile; drupe (not seen ripe) ovoid, bluntly pointed, nearly ¾ in. long, densely finely tomentose.

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* From the Siṅhalese name.

Moist low country; very rare. Ambagamuwa Dist., at about 2000 ft. (Thwaites). Fl. March; yellow.

Endemic.

The leaves are dotted beneath with glands which exude a waxy excretion; the buds also excrete a gum. I have only seen Thwaites's specimens. The stones of the fruit are in India strung together to form rosaries by Hindu fakirs, and by parents to wear as a charm round the necks of their children.

13. **HEMICYCLIA,** *W. and A.*

Evergreen trees or shrubs; l. alternate; fl. small, diœcious, apetalous; male fl. clustered, sepals 4–5, imbricate, ribbed, inner larger; disk orbicular; stam. 4–many; pistillode 0; fem. fl. subsolitary; sep. of male; disk flat, annular; ov. ovoid, 1–2-celled, cells 2-ovuled, stigmas 1–2, broad, orbicular, reniform or flabelliform; fr. an ovoid, fusiform or ellipsoid, 1-seeded drupe, endocarp bony, crustaceous, or coriaceous; seeds arilled, laterally grooved, endosperm fleshy, cotyledons broad, flat.—Sp. 9; 8 in *Fl. B. Ind.*

Fruit globose . . . . 1. H. SEPIARIA.
Fruit oval or ovoid.
  Stam. 10–16 . . . . 2. H. LANCEOLATA.
  Stam. 20–24 . . . . 3. H. GARDNERI.

1. **H. sepiaria,** *W. and A. in Edinb. New Phil. Journ.* xiv. 297 (1833). **Wira,** *S.* **Virai,** *T.*
Thw. in Kew Journ. Bot. vii. 271; Enum. 287. C. P. 2120.
Fl. B. Ind. v. 337. Wight, Ic. t. 1872.

A rigid much-branched shrub, 6–9 ft. high; shoots puberulous; l. $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, broadly oval or oblong, entire or repand-toothed, very coriaceous, glabrous, tip rounded, obtuse or retuse, base rounded or cordate, veins very faint; fl. villous, male $\frac{1}{6}$ in. across, in bracteolate axillary clusters or short racemes; fem. fl. subsessile, pedicel elongating; sep. 4, broad; stam. 6–8 on a cupular disk, fil. slender; ov. 1–2-celled, stigma peltate; fr. fusiform, $\frac{1}{3}$ in. diam., endocarp bony.

Forests of the dry region; very common. Said to be absent from Mannar. Fl. Feb.–March.

Also in S. India.

This is probably the commonest tree over large tracts of the dry forest. It grows to no great size, and in a gnarled and twisted manner, and the wood, though hard, is thus of little value.

The small, round, crimson fruit is ripe in June, and much eaten by the natives. It is sweet, with somewhat of the taste and smell of dates, but more insipid.

2. **H. lanceolata,** *Thw. Enum.* 287 (1861).
Muell. Arg. l. c. 487. C. P. 2211.
Fl. B. Ind. v. 338.

A moderately sized tree; branches slender; young parts and infl. pubescent; l. 1–3 in., distichous, ovate or lanceolate, obtusely subcaudate, acuminate, glabrous on midrib, hairy beneath, base oblique, margin entire or faintly repand, thinly coriaceous, veins reticulate on both surfaces; petiole $\frac{1}{10}$–$\frac{1}{6}$ in., pubescent; fl. $\frac{1}{8}$ in. diam.; male ped. $\frac{1}{12}$ in., fem. rather longer; sep. broadly oblong; stam. 10–16; ov. glabrous, stigma flabelliform, sessile, or on a short stout style; fr. $\frac{2}{3}$ in. long, narrow oval, red, apex oblique, with sometimes a lateral incurved stigma, endocarp coriaceous, crested, and reticulate.

Moist region, below 1000 ft.; very rare. Kalutara, first collected by Moon. Fl. Sept.
Endemic.

3. **H. Gardneri,** *Thw. in Kew Journ. Bot.* vii. 271 (1855). **Gal-wira, Eta-wira,** *S.* [PLATE LXXXII.]
Thw. Enum. 287. Muell. Arg. l. c. 488. C. P. 2121.
Fl. B. Ind. v. 338.

A small tree with numerous slender branchlets; bark whitish; young parts pubescent; l. small, 1$\frac{1}{2}$–2 in., oblong-oval, rounded or subacute at base, obtuse, sometimes emarginate at apex, faintly crenate, glabrous, rather coriaceous, bright green, petiole short, pubescent; fl. axillary, solitary or 2–3 on rather long slender ped.; sep. 4, oval, obtuse, concave, pubescent; stam. about 24, fil. slightly connate at the base; ov. obliquely ovoid, slightly pubescent, 1-celled, style short, thick, stigma dilated, cap-like; fr. small, $\frac{3}{4}$ in., ovoid, apiculate, glabrous, endocarp thin, hard, pulp scanty; seed reniform in section.

Open places in the dry region; rather rare. Jaffna; Puttalam; Nilgala; Haragama; Tiripane. Fl. April; pale yellow.
Endemic.

14. CYCLOSTEMON, *Bl.*

A tree with large leaves; fl. rather large, apetalous, diœcious, in clusters on the old wood; sep. 4 (rarely 5), much imbricate; male fl.:—stam. numerous, distinct, in several rows round a wide disk; fem. fl.:—disk small, flat, annular; ov. globose, 2-celled with 2 ovules in each cell, style very short, stigmas 2, large, flat, transversely oblong; fr. rather large, slightly fleshy, indehiscent, nearly globose, 2-celled, pericarp

thick; seeds one in each cell, cotyledons broad, foliaceous, endosperm fleshy.—Sp. 18; 16 in *Fl. B. Ind.*

C. macrophyllus, *Bl. Bijd.* 598 (1825).

Sphragidia zeylanica, Thw. in Kew Journ. Bot. vii. 270. *C. zeylanicum*, Baill. Ét. Euph. 562; Thw. Enum. 286. C. P. 2424.

Fl. B. Ind. v. 340. Kew Journ. Bot. vii. t. 10. Bedd. Fl. Sylv. t. 278.

A tree, 30–40 ft., bark grey, rugose; young parts with deciduous brown tomentum; l. large, 6–9 in., spreading distichously, oblong-lanceolate, acute, slightly unequal-sided at base, shortly acuminate, very shallowly serrate, thick, veins conspicuous beneath, lat. ones oblique, connected by fine reticulation; petiole thick, short, corky, flexible; stip. small, narrowly lanceolate, serrate; fl. $\frac{3}{4}$ in. diam., on tomentose ped.; sep. rounded, obtuse, concave, spreading, finely tomentose outside; disk in male fl. pubescent; anth. small, oblong; ov. densely pubescent; fr. about $\frac{3}{4}$ in., nearly globose, slightly bilobed, fulvous-pubescent at least when young.

Moist region, at about 3000 ft.; rare. Dolosbagie; Alagala; Kaduganawa. Fl. Feb.–June; lemon-yellow.

Also in Coorg, Andaman Is., Malacca, Java.

The flowers suggest strongly a Bixacea, with which also the habit of the tree corresponds.

15. MISCHODON, *Thw.*

A large tree with spreading branches; l. whorled; fl. small, apetalous, diœcious, in axillary panicles; sep. 5–8 (usually 6), imbricate; disk in male 0, in fem. annular; stam. usually 6, fil. distinct, exserted; pistillode 3-lobed; ov. 3-celled with 2 ovules in each cell, stigmas large, sessile, flat; fr. dry, very deeply 3-lobed, cocci 2-valved; seeds ovoid, testa crustaceous, shining, cotyledons broad, endosperm fleshy.—Monotypic.

M. zeylanicus, *Thw. in Kew Journ. Bot.* vi. 300 (1854). **Tammanua,** *S.* **Tampanai,** *T.*

Thw. Enum. 275. Muell. Arg. l. c. 1124. C. P. 557.

Fl. B. Ind. v. 344. Kew Journ. Bot. vi. t. 10, f. B. Bedd. Fl. Sylv. t. 290.

Tree 30–40 ft. or more, much branched with rough brown bark; branches bluntly quadrangular; young parts finely fulvous-pubescent; l. numerous, usually in whorls of 4, often drooping, linear-oblong or linear-lanceolate, with a narrow rounded base, obtuse, emarginate, subcoriaceous, glabrous and

shining; petiole long, swollen at top, pubescent; sep. pubescent; fil. very long, slender, and anthers pubescent; fr. ¾ in., trigonous, backs of lobes bluntly keeled, glabrous, dark green; seeds dark brown, shining.

Forests of the dry region, common, and extending rarely into the moist region, as Hantane and Galle. Fl. Nov., March; pale yellowish-green or pinkish.

Also at Tinnevelly in S. India.

The young foliage is a fine rich lake colour. Dries a coppery-brown. Timber excellent.

16. **APOROSA,** *Bl.*

Trees; l. entire; fl. very minute, apetalous, diœcious, male numerous, in dense catkin-like spikes, fem. few, in very short spikes or solitary; male fl.:—sep. 4–5, membranous, imbricate in bud; disk 0; stam. 2, exserted, anth. didymous; fem. fl.:—sep. as in male; ov. 2- or 3-celled, ovules 2 in each cell, stigmas short, simple or bifid; fr. more or less ovoid, 2- or 3-valved or irregularly dehiscent or indehiscent, epicarp thick or thin; seeds 1–6, often enclosed in a large pulpy aril (?), testa thin, cotyledons flat in fleshy endosperm.—Sp. 30–40 28 in *Fl. B. Ind.*

Fruit ovoid or spherical.
- Fruit 3-valved . . . . 1. A. LATIFOLIA.
- Fruit indehiscent . . . . 2. A. LINDLEYANA
- Fruit 2-valved . . . . 3. A. LANCEOLATA.
- Fruit irregularly dehiscent . . . . . . 4. A. ACUMINATA.

Fruit fusiform . . . . 5. A. FUSIFORMIS.

1. **A. latifolia,** *Thw. Enum.* 288 (1861). **Máput-kebella, Kampotta, Pépiliya,** *S.*

Agyneia latifolia, Moon, Cat. 65. Muell. Arg. l. c. 470. C. P. 3433. Fl. B. Ind. v. 347.

A middle-sized tree; branchlets thick, marked with scars of l. and stip., glabrous; l. numerous, crowded, large, 4–6 in., broadly oval or sub-rotundate, cordate or rounded or subacute at base, very obtuse or rounded at apex, thick and leathery, glabrous and shining, dark green; petiole ½–1 in., stout; male fl. very numerous and closely crowded, spikes 1–3 together, 1–2 in., fem. fl. sessile in clusters; male fl.:—sep. linear-lanceolate, rusty-hairy; stam. exserted; fem. fl.:—ov. pilose, stigmas reflexed, bilobed; fr. large, ¾–1 in., broadly ovate-ovoid, slightly tapering to a blunt point, tipped with withered styles, smooth, brownish-orange, pericarp thick, spongy-woody,

tardily dehiscent from below into 3 very thick valves, each again splitting down centre; seeds usually 3, cotyledons green.

Moist region, below 1000 ft.; rather rare. Kukul Korale; Kalutara. About Moragala, Pasdun Korale; frequent. Fl. March, April.

Endemic.

A handsome little tree from the large glossy foliage. Wood very hard and durable. Fruit eaten.

2. **A. Lindleyana,** *Baill. Ét. Gen. Euph.* 645 (1858). **Kebella, Barawa-embilla,** *S.*

Scepa Lindleyana, Wight, Ic. ii. 1, 5. Thw. Enum. 288. C. P. 2153.

Fl. B. Ind. v. 349. Wight, Ic. t. 361. Bedd. Fl. Sylv. t. 286.

A middle-sized much-branched tree; bark brown, smooth; young parts glabrous; l. 2½–4 in., on short glabrous petioles, ovate-oval, rounded at base, slightly acuminate, obtuse, undulate, glabrous and shining, rather stiff; stip. large, lanceolate, acute, soon deciduous; male fl. sessile, spikes 1–4 together, ½–2 in. long, dense; sep. 4, ciliate; stam. 2–3; fem. fl. on short ped., racemes very short; sep. small, ovate, acute, glabrous; ov. flask-shaped, bristly-hairy, style stout, with 3 large laciniate recurved stigmas; fr. over ⅓ in., nearly globose, pointed with style, glabrous, pericarp thin, indehiscent; seed solitary, with a yellow pulpy covering.

Moist region, to 2000 ft.; common. Fl. Jan., Feb.

Also in S. India.

The fruit is eaten.

3. **A. lanceolata,** *Thw. Enum.* 288 (1861). **Hin-kebella,** *S.*

Agyneia multilocularis, Moon, Cat. 65. *Lepidostachys lanceolata*, Tul. in Ann. Sc. Nat. 3, xv. 254. C. P. 2152.

Fl. B. Ind. v. 351.

Small tree; branches slender; young parts glabrous; l. 3–5 in., oblong-lanceolate, caudate-acuminate, acute at base, glabrous, somewhat shining, stiff; petiole ¼–½ in., slender; stip. as long as, or longer than, petiole, lanceolate, acuminate, soon falling; fl. sessile, very small; male spikes short, ¼–½ in., 2–6 in a cluster, bracts very broad, ciliate; fem. fl. in very small clusters of 3 or 4; ov. 2-celled, stigmas 2, very minute, entire; fr. small, ⅓ in., in small nearly sessile axillary clusters, nearly globose, glabrous, 2-valved; seed usually solitary, with a yellow pulpy coat.

Moist region, up to 2000 ft.; common, especially below 1000 ft. Fl. Jan.–March; yellow.

Endemic.

The leaves dry a very pale yellow-green. The pulp round the seed is edible.

4. **A. acuminata,** *Thw. Enum.* 288.
Muell. Arg. l. c. 473. C. P. 2530.
Fl. B. Ind. v. 348.

A small tree, slightly branched; twigs very slender; young parts pubescent; l. 2½–3 in., lanceolate, acute at base, caudate-acuminate, acute, glabrous, thin; petiole ¼ in., slender; male fl.:—spikes short, under ¾ in., usually solitary; cal. pubescent; fem. fl. solitary; ov. silkily hairy, stigmas shortly bifid, spreading; fr. ⅔ in. long, ovate-ovoid, hairy, tipped with reflexed styles, pericarp hard-fleshy, irregularly dehiscent, smooth, red; seeds 3, each with a reddish pulpy covering.

Moist region, 2–3000 ft.; rare. Ambagamuwa; Pitigalakande, near Balangoda. Fl. Sept.; greenish.
Also at Tinnevelly, S. India.
Dries a pale whitish-green.

5. **A. fusiformis,** *Thw. Enum.* 288 (1861).
A. Thwaitesii, Baill. Ét. Euph. 645 (name only). Muell. Arg. l. c. 471. C. P. 30.
Fl. B. Ind. v. 351.

A middle-sized tree; bark brown; twigs stout; young parts glabrous; l. 2½–4½ in., from broadly oval to almost rotundate, acute or rounded at base, very obtuse at apex, often with revolute edges, glabrous, thick and coriaceous, purple when young; fl. sessile, male spikes 1–4 together, ¾–1 in., bracts rounded, ciliate and ferrugineo-pubescent; fem. fl. 2–6 in a cluster; ov. glabrous; fr. about ¾ in., in short axillary spikes, fusiform, capped with stigmas, glabrous, pericarp rather thin, cells hairy within; seeds 1 or 2, oblong, plano-convex.

Forests of the montane zone, 4–6000 ft.; rather common. Dimbula; Dickoya; Ramboda; Adam's Peak; Ambagamuwa, &c. Fl. Dec.–March; yellowish.
Endemic.

17. DAPHNIPHYLLUM, *Bl.*

A tree; l. long-petioled, entire, without stip.; fl. apetalous, diœcious, in axillary racemes; male fl.:—sep. 5–8, minute; stam. 5–8 with very large apiculate anth.; no disk or pistillode; fem. fl.:—sep. as in male, but deciduous; ov. imperfectly 2-celled, with 2 ovules in each cell, stigmas thick, recurved, undivided; fr. an ovoid drupe; seed solitary, testa membranous, embryo small in thick fleshy endosperm, cotyledons narrow.—Sp. 11; 7 in *Fl. B. Ind.*

This genus is considered by some botanists the type of a distinct natural order.

D. glaucescens, *Bl. Bijd.* 1153 (1826).

Goughia neilgherrensis*, Wight, Ic. v. 2, 22. *D. neilgherrense*, Thw. Enum. 290. C. P. 491.

Fl. B. Ind. v. 353 (*D. glaucescens*, Bl.). Wight, Ic. tt. 1878, 9. Bedd. Fl. Sylv. t. 288 (*D. Roxburghii*, Baill.).

A small tree; branchlets stout, prominently marked with scars of the petioles; young parts glabrous; l. numerous, closely placed near end of year's growth, $2\frac{1}{2}$–4 in., obovate-oblong, tapering to base, rounded at apex, glabrous, usually glaucous beneath, venation reticulate; petiole long, $\frac{3}{4}$–$1\frac{1}{4}$ in.; fl. on longish ped., in short racemes from axils of lower l.; sep. obtuse; fil. very short, anth. erect, blunt, apiculate, very much larger than the sep.; fr. about $\frac{1}{2}$ in., ovoid, glabrous, tipped with style-base.

Forests of montane zone, 4–7000 ft.; rather common. Maturata; Pedurutalagala; Hakgala; Galagama; Ambagamuwa. Fl. July; yellowish.

Also in S. India, Java, and China.

Habit of a lauraceous plant; young leaves often pale pink.

18. ANTIDESMA,† *L.*

Trees or shrubs; l. entire, stipulate; fl. very small, diœcious, in lax spikes; male fl.:—cal. of 3–7 imbricate segm.; disk entire or lobed; stam. 3–5, inserted on disk, fil. inflexed in bark, anth.-cells often distant; pistillode generally minute; fem. fl.:—cal. as in male; disk annular or pulvinate; ov. usually 1-celled, with 2 ovules in each cell; stigmas 2–4; fruit small, drupaceous, more or less compressed, juicy; cotyledons flat, endosperm fleshy.—Sp. about 60; 32 in *Fl. B. Ind.*

L. very obtuse, tomentose beneath . . . 1. A. GHESÆMBILLA.
L. more or less acuminate, glabrous.
  Stam. 3 or 4.
    Male fl. sessile.
      L. over 4 in. . . . . 2. A. BUNIUS.
      L. under 3 in. . . . . 3. A. ZEYLANICUM.
    Male fl. stalked . . . . 4. A. DIANDUM.
  Stam. 5 . . . . 5. A. PYRIFOLIUM.

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* Commemorates George Gough, B. C. S., who in 1842 explored the Nilgiris with Genl. Munro.

† Name bestowed by Burmann on *A. zeylanicum*, on the supposition that it was the 'Noeli-tali' of Rheede, Hort. Mal. iv. 115 (really *A. Bunius*), which is said to cure the bite of the cobra.

1. **A. Ghesæmbilla,*** *Gaertn. Fruct.* i. 189 (1788). **Bu-embilla,** *S.*

Herm. Mus. 11, 19. Fl. Zeyl. n. 357 (in part). *A. Alexiteria*, L. (in part). *A. pubescens*, Moon, Cat. 68. *A. paniculatum*, Roxb.; Thw. Enum. 289. C. P. 773.

Fl. B. Ind. v. 357. Wight, Ic. t. 820 (not good).

A small tree; bark grey; twigs and young parts pubescent or rusty-tomentose; l. $1\frac{1}{2}$–3 in., oblong-orbicular, rounded at base and apex, often emarginate, glabrous above, densely pubescent (often becoming sub-glabrous) beneath; petiole rather long, pubescent; fl. sessile, closely placed on short, tomentose, panicled, terminal spikes; male fl.:—cal. pubescent, disk deeply lobed, stam. usually 5; fem. fl.:—ov. pubescent; fr. $\frac{1}{3}$ in., nearly globose, smooth, reddish-purple.

Moist region, to 2000 ft.; common. Fl. reddish.
India, Malaya, China, Africa (?), Australia.
Fruit sub-acid, pleasant. Leaves eaten in Bengal.
Burmann's name, *Ghesæmbilla*, is clearly a corruption of the Sinhalese one. Gaertner's references are all to *Embelia Ribes*, but his figures of the seed (t. 39, f. 5) are good for the present species.

2. **A. Bunius,**† *Spreng. Syst. Veg.* i. 826 (1825). **Karawala-Kebella,** *S.*

Fl. Zeyl. n. 357 (in part). *A. Alexiteria*, L. (in part). Thw. Enum. 289. C. P. 660.

Fl. B. Ind. v. 358. Wight, Ic. t. 819.

Small tree, with greyish-brown bark; young parts pubescent; l. rather large, 4–6 in., lanceolate or obovate-lanceolate, tapering at base, slightly acuminate, apiculate, glabrous, and shining; petiole short, stout; stip. acicular, hairy, quickly deciduous; fl.-spikes solitary, 1–3 in., stalked, terminating branchlets, male sometimes branched at base; fl. numerous, rather lax, male sessile, fem. slightly stalked; male fl.:—cal. tomentose, segm. 3, shallow, rounded; disk lobed, glabrous; stam. 3, exserted; pistillode short, truncate; fem. fl.:—ov. glabrous, stigmas 3, large, short, dilated, spreading; fr. $\frac{1}{3}$ in., globose-ovoid, stalked, smooth, very juicy, black when ripe, previously red.

Var. β, **Thwaitesianum,** *Trim. Cat. Ceyl. Pl.* 81.
A. Thwaitesianum, Muell. Arg. l. c. 263. C. P. 2922.

L. subcoriaceous; infl. nearly glabrous; stam. usually 4.

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* Taken from Burmann, but his plant was *Embelia Ribes*, not this (Thes. 112).

† From the Malay name 'Bune,' as given by Rumphius.

Moist region, up to 3000 ft.; common. Var. β, Kalutara. Fl. April, May, Sept.; reddish.

India, Burma, Malaya.

Fruit eaten.

There are specimens in Hermann's Herbarium. The fruit is very juicy, acidulous, and pleasant to the taste. The inflorescence is not unfrequently converted into curved and twisted galls, over 2 in. long.

3. **A. zeylanicum,** *Lam. Encycl. Meth.* i. 207 (1783). **Hin-embilla,** *S.*

Herm. Mus. 26. Burm. Thes. 22. Fl. Zeyl. n. 357 (in part), *A. Alexiteria.* L. Sp. Pl. 1027 (in part); Moon, Cat. 68. Thw. Enum. 289. Muell. Arg. l. c. 256. C. P. 2210.

Fl. B. Ind. v. 359 (*A. Alexiteria*). Burm. Thes. t. 10.

Small tree, much branched; twigs numerous, verticillate; young parts glabrous; l. numerous, on very short petioles, small, $1\frac{1}{4}$–$2\frac{1}{4}$ in., oval, acute at base, acuminate, apiculate, glabrous, and shining, pale green, rather thin; spikes solitary or few, terminating twigs, $\frac{3}{4}$–$1\frac{1}{2}$ in., slender, fl. sessile, rachis pubescent; cal.-segm. 3–4, hairy; stam. 3; ov. flask-shaped, glabrous, styles 2 or 3, recurved; fr. small, $\frac{1}{6}$ in., ovoid, rather lop-sided, red.

Low country in both moist and dry regions; common. Fl. July; green.

Also in S. India.

There is no reason for restricting Linnæus's name, *A. Alexiteria*, to this; it included equally *A. Bunius* and *A. Ghesæmbilla.*

Burmann's figure of the male plant is good and characteristic.

Dries a pale brown.

4. **A. diandrum,** *Roth, Nov. Sp.* 369 (1821).

Stilago lanceolaria, Roxb.; Moon, Cat. 68. *A. lanceolatum*, var. *Walkeri*, Tul. in Ann. Sc. Nat. 3, xv. 196. *A. lanceolarium*, Wight; Thw. Enum. 289. C. P. 2602.

Fl. B. Ind. v. 361. Wight, Ic. t. 766 (not good).

A much-branched bush or small tree; twigs very slender, brownish-grey, smooth; young parts glabrous; l. 2–6 in., from linear to oval, usually lanceolate, acute at base, acuminate, very acute at apex, glabrous; petiole very short; stip. linear, very acute; fl. on slender glabrous ped. in mostly terminal, short, very lax, glabrous spikes; male fl.:—cal.-segm. 4, rounded, shallow, glabrous; stam. 3 or 4; fem. fl.:—cal.-segm. deeper; styles 2, deeply bifid; fr. $\frac{3}{8}$ in., broadly ovoid, very juicy, smooth, dark purple.

Moist region, below 1500 ft.; rather rare. Pasdun-Korale; Hiniduma; Singhe-Rajah Forest; Ratnapura; Ambagamuwa. Fl. March, April; greenish.

Also in India and Burma.

Very variable in the width of the leaves, from 1½ to less than ⅛ in. The fruit is eaten, and the acid leaves, in India, made into chutney. I follow Fl. B. Ind. in reducing this to *A. diandrum* with some doubt, as the flowers are never diandrous in Ceylon, nor does our plant agree in some other respects.

5. **A. pyrifolium,** *Muell. Arg. in Linnæa*, xxxiv. 68 (1865).
A. montanum, Thw. Enum. 289 (non Bl.). C. P. 2208.
Fl. B. Ind. v. 362.

A middle-sized tree; young parts pubescent; l. 2–3 in., lanceolate or oblong-lanceolate, acute at base, shortly acuminate-caudate, glabrous, rather stiff; petiole ¼ in., finely pubescent; male fl. shortly stalked, in lax axillary infl., often branched at the base; cal.-segm. 5, very obtuse; disk rather large, fleshy, surrounding the pistillode; stam. 5, fil. long, much exserted; fem. fl. not seen; fr. nearly globose, over ¼ in., pulpy, purple, stigmas terminal.

Moist region, up to 5000 ft.; rather common. Pasdun Korale; Madagatte, S. Prov.; Ambagamuwa; Hantane; Ramboda; Hanasgiriya; Ramgala. Fl. Dec.–March; pale pinkish-yellow.
Endemic.

A. brunneum, Hk. f. in Fl. B. Ind. v. 359. Some specimens of C. P. 2208 are described as a new species under this name, and placed next *A. zeylanicum*. From the material here, I am not able to distinguish this; the fl. are described as quite sessile.

[*Microdesmis caseariæfolia*, Planch., is given as occurring in Ceylon in B. and H. f. Gen. Pl. iii. 288; but this seems to be an error.]

19. JATROPHA, *L.*

Undershrub, rather succulent; l. palmately lobed; stip. laciniate; fl. monœcious, in stalked cymes; sep. 5, imbricate; pet. 5, longer than sep., contorted in bud; male fl.:—stam. 8, fil. connate; disk of 5 glands; pistillode 0; fem. fl.:—disk annular, lobed; ov. usually 3-celled, with 1 ovule in each cell; styles 3, bifid and recurved; fr. 2–4- (usually 3-) celled, with crustaceous 2-valved cocci; seeds ovoid, testa crustaceous, embryo in fleshy endosperm, cotyledons broad.—Sp. 70; 4 in *Fl. B. Ind.*

***J. glandulifera,** *Roxb. Fl. Ind.* iii. 688 (1832). **Atalai,** *T.*
J. glauca, Thw. Enum. 277 (non Vahl). C. P. 2168.
Fl. B. Ind. v. 382. Pluk. Phytogr. t. 220, f. 4.

Semi-shrubby, 1–3 ft.; stem stout, glabrous, and shining, marked with large prominent leaf-scars; l. 3–4 in., deeply palmately cut into 3 or 5 lobes, which are obovate-oval,

acuminate, acute, sharply serrate with gland-tipped serrations; petiole 2–3 in., without glands; stip. divided into long capillary gland-tipped segm.; fl. in stalked cymes on stout ped. as long as petioles; cal.-segm. lanceolate, not glandular-ciliate; pet. obtuse; ov. glabrous; fr. ovoid-globose, ½ in., faintly lobed, glabrous; seeds ⅓ in., oblong-ovoid, smooth.

Low country and chiefly on the coast, especially in the dry region; common. Fl. Jan.; yellowish.

Also in S. India and Trop. Africa.

The leaves yield in India a green dye, and the seeds an oil extensively used in cases of rheumatism and paralytic affections.

This is probably an introduction. It is in many parts of the coast extremely abundant, as at Jaffna, Mannar, Hambantota, where it is a gregarious weed covering large areas of ground. Fl. Zeyl. n. 347, *Croton spinosum*, L., is, to judge from Hermann's drawing, on which it is based, probably this plant.

J. gossypifolia, L., is an occasional weed in cultivated ground, and often confounded with *J. glandulifera*, but has glandular petioles and red flowers. Probably native to Trop. America.

J. Curcas, L. (*Rata-endaru*, S., *Kaddamanakku*, T.) is very commonly planted as a fence round native gardens. The seed is the well-known 'Physic-nut,' violently purgative.

For the medicinal and other uses of this plant, see Murray in Watts's Dict. of the Economic Products of India.

Aleurites triloba, Forst. (*A. moluccana*, Willd.), is the *Rata-kékuna* or *Tel-kékuna*, a very common tree about villages in the low country of the moist region, but certainly nowhere wild. The seeds are known as oil-nuts or candle-nuts, and the expressed oil is largely used for lighting and other purposes. It is a native of the Pacific Islands, and perhaps of the Moluccas, but must have been long ago introduced. There are specimens in Herm. Herb., and it is n. 348 of Fl. Zeyl. (*Jatropha moluccana*, L.).

30. **CROTON**, *L.*

Bushes or small trees, young parts stellate-hairy or scaly; l. usually with a pair of circular glands at junction with petiole; stip. linear; fl. monœcious, in usually terminal slender spikes, racemes, or panicles, fem. few at base; male fl.:—sep. 5, imbricate; pet. 5, small, often woolly or hairy; disk glands opp. the sep.; stam. 12–30, fil. inflexed in bud; pistillode 0; fem. fl.:—sep. 5, often enlarged in fr.; pet. 0; ov. densely stellate-hairy, 3-celled, with 1 ovule in each cell, styles very large, usually bifid, and again divided, spreading; fr. globose more or less 3-lobed, always stellate-hairy, cocci hard, 2-valved, dehiscent; seeds 3, ovoid, testa crustaceous, endosperm fleshy.—Sp. 53; 27 in *Fl. B. Ind.*

Fruit with scales as well as stellate hairs.
  L. silvery beneath, with white scales . . 1. C. RETICULATUS.
  L. glabrous when mature . . . . . 2. C. OBLONGIFOLIUS.
Fruit more or less stellate-hairy, without scales.
  L. 3–5-nerved at base, stellate-hairy.
    Capsule ½ in.; not scandent . . . 3. C. AROMATICUS.
    Capsule ¾ in.; semi-scandent . . . 4. C. CAUDATUS.
  L. penninerved, sparingly stellate-hairy.
    Infl. stellate-hairy . . . . . . 5. C. MOONII.
    Infl. glabrous . . . . 6. C. KLOTZSCHIANUS.
  L. strongly 3-nerved at base, nearly glabrous. 7. C. NIGROVIRIDIS.

1. **C. reticulatus,** *Heyne ex Wall. Cat.* n. 7724 B (1828).
C. hypoleucum, Dalz.; Thw. Enum. 276. *C. zeylanicus*, Muell. Arg. l. c. 581. C. P. 2110.
Fl. B. Ind. v. 386.

A bush; bark smooth, whitish; young parts finely stellate-hairy; l. 3½–5½ in., ovate-lanceolate, rounded at base, acuminate, acute, entire, glabrous above, densely covered with minute silvery scales beneath, with a pair of stalked glands at base; petiole ½–1¼ in., stellately hairy; spikes lax, minutely scaly; fl. on short ped., fem. few, at base; male fl.:—sep. oval; pet. short, obtuse; stam. 14–20; fem. fl.:—sep. linear, much enlarged in fruit; fr. oblong-ovoid, under ½ in., slightly 3-lobed, apiculate, rather rough, with stellate hairs mixed with scales; seeds purplish-brown, mottled with white.

Moist region, 2–3000 ft.; rare. Hantane. Fl. Nov.; greenish.
Also in Peninsular India.

2. **C. oblongifolius,** *Roxb. Fl. Ind.* iii. 685 (1832). **Millakunari,** *T.*
Thw. Enum. 276. C. P. 2114.
Fl. B. Ind. v. 386.

A small tree; bark pale, smooth; young parts minutely scaly; l. numerous, 3–7 in., narrowly oblong-lanceolate, tapering to both ends, obtuse, faintly serrate, without obvious glands at base, glabrous on both sides when mature; petiole ½–1 in. scaly; spikes stellate-pubescent; fl. pedicellate, fem. few, at base; sep. with scales, narrower in fem.; stam. 12; capsule (not seen) '⅓ in., globose, scabrid with scales, top depressed.'

Dry region; rare. Batticaloa; Uma-oya. Fl. July; pale greenish.
Also India and Burma.
Our plant has narrower leaves than the Indian.

3. **C. aromaticus,** *L. Sp. Pl.* 1005 (1753). **Wel-keppetiya,** *S.* **Teppaddi,** *T.*
Herm. Mus. 11. Burm. Thes. 202. Fl. Zeyl. n. 345. Moon, Cat. 65. Thw. Enum. 275. Muell. Arg. l. c. 588. C. P. 2116.
Fl. B. Ind. v. 388.

A shrub or small tree; bark smooth, pale grey; young parts rough with harsh stellate hairs; l. $2\frac{1}{2}$–4 in., ovate, rounded or subcordate at base, shortly attenuate, acute, irregularly and shallowly crenate-serrate, slightly rough and with few distant stellate hairs above, much more so especially on veins beneath, pair of glands at base small, circular, peltate; petiole $\frac{3}{4}$–$1\frac{1}{2}$ in., rough; fl. numerous, on short ped.; sep. acute, stellate-hairy; male fl.:—pet. ovate, bordered with white hair; stam. about 30; disk with long white hair; fem. fl.:—styles split almost to base into very long filiform branches; fr. under $\frac{1}{2}$ in., nearly globose, barely 3-lobed, rough with scanty, short, stellate hair.

Var. β, **lacciferus,** *Trim.* **Keppetiya, Gas-keppetiya,** *S.*
Herm. Mus. 37, 46. Burm. Thes. 201. Fl. Zeyl. n. 344. *C. lacciferus,* L. Sp. Pl. 1005; Moon, Cat. 65; Thw. Enum. 275. Muell. Arg. l. c. 588. C. P. 2117.
Burm. Thes. t. 91. Wight, Ic. t. 1915.

Larger, young parts almost villous, with yellowish hair; l. larger and broader, hairy on both sides, woolly beneath, with simple longer hairs mixed with stellate ones; stip. smaller, filiform; stam. 20 or less; disk slightly hairy; fr. more densely hairy; seeds ovoid, smooth, dark-brown.

Low country, the type principally in the dry region; common. Var. β chiefly in the moist region, up to 3000 ft.; very common. Fl. Aug.–Nov.; greenish-white.

Also in S. India.

The Fl. B. Ind. does not distinguish *C. lacciferus;* but it is easily recognisable, and at least a marked variety, if not a species.

The leaves when withering turn a bright brick-red colour; they are very slightly aromatic.

A small red coccid occurs on the bark of the older trees, and is collected in districts where it is abundant to mix with the colours used in lacquer work. This lac is collected in the dry seasons near Matale for the Kandyan lacquer-industry. It is melted in a metal pot over a fire, and is then called Keppitiya Resin.

4. **C. caudatus,** *Geisel. Crot. Monogr.* 73 (1807).
Muell. Arg. l. c. 599.
Fl. B. Ind. v. 388.

Very like *C. aromaticus*, but semi-scandent, with long horizontal branchlets; l. 3–4 in., cordate at base, acute, faintly and irregularly serrate, stellate-hairy beneath when young, afterwards glabrous; racemes very long, slender; fl. stalked, bracts setaceous; sep. densely stellate-hairy; stam. 18–30, fil. very hairy below; fr. (not seen) '$\frac{2}{3}$–1 in., globose or broadly oval, woody, scabidly pubescent, 6-valved.'

Dry region; rare. Koddryar, near Trincomalie. Specimens from Walker without locality are also referable to this; Muell. Arg. gives

Thunberg as his authority for Ceylon, and Fl. B. Ind. says 'north part of the island.' Fl. Sept. Specimens from Walker without locality are also referable to this.

India, Malaya, Philippines.

Differs from *C. aromaticus* chiefly in its somewhat scandent habit. I have only seen male specimens, so that my material is insufficient. Muell. Arg. refers *C. aromaticus* of Gaertner and *C. lacciferus* of Wight to this species.

5. **C. Moonii,** *Thw. Enum.* 276 (1861).
C. punctatum, Moon, Cat. 65 (non Retz.). Muell. Arg. l. c. 590. C. P. 577. Fl. B. Ind. v. 390.

A small tree; bark brown; young parts densely stellate-hairy; l. 2½–5 in., oval-oblong, rounded or slightly cordate at base, subacute, apiculate, nearly entire, rough on both sides with scattered stellate hairs; petiole ½–1 in., stellate-hairy, with a pair of sessile glands at summit; stip. linear-subulate, deciduous; fl. stalked, racemes lax, very stellate-hairy; sep. stellate-hairy; pet. woolly at margin; fr. ⅓ in., depressed-globose, finely coated with swollen bases of stellate hairs.

Moist low country; very rare. Only at Kalutara. Fl. Sept.; greenish. Endemic.

The leaves when dried become nearly black on upper and pale on lower surface.

6. **C. Klotzschianus,** *Thw. Enum.* 276 (1861).
C. Thwaitesianus, Muell. Arg. in Linnæa, xxxiv. 116. C. P. 2113. Fl. B. Ind. v. 392. Wight, Ic. t. 1914 (*Tiglium Klotzschianum*).

A shrub or small tree; bark whitish; young shoots with scattered stellate hairs; l. 2–4 in., oblong-lanceolate, rounded at base, slightly acuminate, acute, shallowly serrate, pale and with scattered stellate hairs beneath, somewhat 3-nerved at base, thin; petiole with a pair of small glands at summit; racemes short, erect, very lax; male fl.:—sep. and pet. lanceolate, hairy; stam. about 14; fem. fl. on short stout ped.; styles very deeply divided into long filiform branches; fr. ⅓ in., 3-lobed, stellate-hairy, crowned with long styles, endocarp very hard; seeds grey mottled with black.

Dry and intermediate regions; rather common. Hanguranketa; Haragama; Kurundu-oya; Nalande; Mineri; Jaffna. Fl. Feb., July, Aug.; white.

Also in S. India.

C. Tiglium, L., *Jayapala,* S., *Nervalam,* T., the croton-oil plant, is a not uncommon inhabitant of native gardens, and has also been cultivated for the oil as a commercial product on estates, but is not a native here. There are specimens in Herb. Hermann, and it is n. 343 of Fl. Zeyl., and well figured in Burm. Thes. t. 90.

7. **C. nigro-viridis,** *Thw. Enum.* 276 (1861).
Muell. Arg. in DC. Prod. l. c. 601. C. P. 3637.
Fl. B. Ind. v. 393.

A small tree; bark smooth, grey; young parts stellate-hairy; l. 2½–4 in., oval, acute at base, subacute, sparingly serrate, glabrous beneath, with very minute scurf above mixed with scattered distant stellate hairs, rather thick, strongly 3-nerved at base; racemes long, slightly stellate-hairy; sep. sparsely stellate-hairy, in male obtuse with membranous margins; styles divided to base; fr. over ⅓ in., woody; distinctly 3-lobed with keeled lobes, slightly rough with small thickened bases of stellate hairs, top depressed.

Lower montane zone, 3–5000 ft.; rather rare. Ramboda; Dickoya; Nitre Cave Dist.; Lagalla. Fl. April, Sept.
Endemic.

21. **GIVOTIA,** *Griff.*

Tree; l. palmately nerved; fl. moderate-sized, diœcious, in terminal panicles, male panicles long, fem. very short; sep. 5, unequal, imbricate; pet. 5, connate into a cylindrical cor.; male fl.:—stam. about 15, on a woolly receptacle, outer shorter, fil. connate below; pistillode 0; fem. fl.:—ov. 2–3-celled, with one ovule in each cell, styles short, bifid; fr. a subglobose, 1-celled, hoary drupe, ¾–1 in. diam., with thin crustaceous endocarp; seed solitary, large, globose, testa bony, endosperm fleshy, cotyledons broad, flat.—Monotypic.

G. rottleriformis, *Griff. in Calc. Journ. Nat. Hist.* iv. 388 (1844).
Puttalai, *T.*
Fl. Zeyl. n. 346. *Croton moluccanum,* L. Sp. Pl. 1005 (chiefly). Thw. Enum. 278. C. P. 1139.
Fl. B. Ind. v. 395. Wight, Ic. t. 1889. Bedd. Fl. Sylv. t. 285.

A small tree; branchlets very stout, rather succulent, smooth, marked with prominent leaf-scars; young parts scurfy tomentose, with stellate hairs; l. variable in size, 3–7 in., broadly oval or rotundate, often broader than long, more or less cordate at base, acute or subacute, coarsely and irregularly dentate or incised, palmately veined, glabrous above when mature, densely coated beneath with a yellowish or fulvous tomentum of stellate hair; petiole about as long as leaf, stellate-hairy, with a few glands half way up, and one at the summit; bracts on infl. linear; sep. stellate-hairy outside; fil. hairy; fr. globose-ovoid, about 1 in., smooth, green, indehiscent; seed nearly globose, purplish.

Dry region; rather rare. Jaffna Dist.; Puttalam; Dambulla; Uma-oya. Fl. Aug.; yellow.
Also in S. India.

The specimens in Herb. Hermann to which Linnæus gave the name *Croton moluccanum* are only leaves, but almost certainly belong to this species. *Mallotus moluccanus*, Muell. Arg., is quite another plant, and not native to Ceylon but to Amboyna.

22. TRIGONOSTEMON, *Bl.*

Shrubs; fl. monœcious in terminal and axillary racemes; sep. 5, imbricate; pet. 5; stam. 3, connate in a short column, anth. sessile on a thickened connective; pistillode, 0; disk of 5 glands; fem. fl.:—ov. 3-celled, with one ovule in each cell, hairy, styles bifid or twice bifid; fr. a 3-celled capsule; seeds nearly globose, mottled, embryo flat in fleshy endosperm.—Sp. 15; 9 in *Fl. B. Ind.*

Pet. of male fl. as long as sep., very deeply 2-lobed 1. T. DIPLOPETALUS.
Pet. twice as long as sep., not 2-lobed . . . 2. T. NEMORALIS.

1. **T. diplopetalus,** *Thw. Enum.* 277 (1861). [PLATE LXXXIII.]
Muell. Arg. l. c. 1108. C. P. 570.
Fl. B. Ind. v. 398.

A bush, slightly branched; branchlets nearly glabrous; buds pubescent; l. rather large, 6–10 in., lanceolate, tapering to base, shortly acuminate, acute, entire, glabrous, rather thin; petiole about $\frac{1}{2}$ in., with two minute glands at summit; fl. shortly stalked, numerous, in erect spicate racemes, often mixed; male fl.:—sep. oval, obtuse, concave; pet. about as long as sep., much denticulate and crisped, divided nearly to base into two rounded lobes; fem. fl.:—sep. $\frac{1}{4}$ in., oblong-lanceolate, apiculate; pet. as in male, but larger and reflexed; styles twice bifid, with short stout branches; capsule about $\frac{1}{2}$ in., somewhat depressed, hairy.

Forests in the moist region, below 1000 ft.; very rare. Pelawatte Forest, Hewesse, Pasdun Korale, abundant. Fl. March–May and Sept.; dull crimson-lake.
Endemic.

2. **T. nemoralis,** *Thw. Enum.* 277 (1861).
Muell. Arg. l. c. 1108. C. P. 3570.
Fl. B. Ind. v. 398. Bedd. Ic. Pl. Ind. Or. t. 183.

A slender bush or small tree; bark yellowish-grey, rather smooth; young parts strigose-hairy; l. numerous, alt. or sub-opp. usually rather crowded at end of year's growth, 4–8 in., linear-lanceolate, much tapering at both ends, obtuse at apex, irregularly and shallowly crenate-serrate, glabrous and shining, rather thick, veins conspicuous; petiole short, stout, curved, channelled above; stip. small, subulate, pubescent; fl. in

narrow, erect, stiff, spicate racemes, male on slender ped. in small clusters, fem. solitary on very stout ped. and somewhat larger; sep. oblong, subacute, pubescent, with a short horizontal horn near the end; pet. oblong (narrower in male), acute, nearly twice as long as sep.; styles broad, recurved; capsule $\frac{1}{2}$ in., 3-lobed, depressed, thickly crustaceous, roughly pubescent, top depressed.

Intermediate region; rare. Between Medamahanuwara and Bintenne; Puwakpitiya, Matale East, abundant. Fl. Feb.–June; dull crimson.

Also in Travancore.

Codiæum variegatum, Bl. The 'Croton' of gardens, native to the Moluccas and Pacific Islands, has long been cultivated under numerous varieties, and is very common in gardens in the low country. The oldest form here seems to be *crispum*, which was collected in Ceylon by Thunberg in 1777.

23. **OSTODES,** *Bl.*

A large tree; l. large, serrate; fl. diœcious, in long pendulous racemes; male fl.:—sep. 5, unequal, imbricate; pet. 5, longer than sep.; disk of 5 glands; stam. 15, fil. free, outer ones shorter; pistillode 0; fem. fl.:—sep. and pet. as in male; disk annular, hairy; ov. 3-celled, with one ovule in each cell, styles 3, bifid; fr. a subglobose capsule, cocci 3, bony, dehiscent; seeds ovoid, testa crustaceous, endosperm fleshy, cotyledon broad, flat.—Sp. 6–8; 5 in *Fl. B. Ind.*, but none in Peninsular India.

O. zeylanica, *Muell. Arg. in Linnæa*, xxxiv. 214 (1865). **Walkékuna, Olupetta,** *S.*

Desmostemon zeylanicus, Thw. Enum. 278. Muell. Arg. in DC. Prod. l. c. 1114. C. P. 2160.

Fl. B. Ind. v. 409. Bedd. Fl. Sylv. t. 274 (reprod. from Trans. Linn. Soc. xxv. t. 27).

A tall tree; bark smooth; young parts puberulous, branches minutely lenticellate; l. large, numerous, persistent, 6–12 in., lanceolate-oblong, acute at base, subacute at apex, very coarsely serrate, glabrous, thick, paler beneath; petiole 3–4 in., cylindrical, stiff, horizontal, thickened and corky at both ends; fl. rather large, stalked, in small clusters, panicles 1–2 ft. long; bracts very small; sep. obtuse; pet. obtuse, erect, recurved at apex; stam. slightly exserted; capsule $1\frac{1}{4}$ in., slightly 6-grooved, finely tomentose with close stellate hair; seeds large, mottled.

Var. β, **minor,** *Thw. Enum.* 278. *O. minor*, Muell. Arg. l. c. *Trigonostemon zeylanicus*, Muell. Arg. in DC. l. c. 1106. C. P. 2158.

A shrub or small tree; fl. fruit and all parts much smaller.

Forests of the moist region, up to 4000 ft.; rather common. Var. β, below 1000 ft.; common. Kalutara (Moon). Fl. Feb. and Oct.; yellow.
Also in Travancore and the Wyraad, S. India.

A very handsome tree. The flowers are strongly sweet-scented. The adherent petals simulate a campanulate gamopetalous corolla. Var. β has a different aspect, and may be, as considered by Mueller, a distinct species.

24. BLACHIA, *Baill.*

Shrub; l. entire, shining; fl. monœcious, on long ped., male in racemose umbels, fem. usually in threes; male fl.:—sep. 4 or 5, membranous, imbricate; pet. 4 or 5, much smaller, hyaline; disk of 4 or 5 scales; stam. about 15, on a convex receptacle, anth.-cells marginal; pistillode 0; fem. fl.:—sep. 4 or 5, unequal, imbricate in bud, becoming slightly enlarged in fruit; pet. 0; disk obscure; ov. 3-celled, with one ovule in each cell, styles 3, filiform, deeply bifid; fr. small, 3-lobed, of 3 2-valved cocci, supported on persistent sep.; seeds oblong, testa crustaceous, shining, endosperm fleshy, cotyledons broad, flat.—Sp. 5; all in *Fl. B. Ind.*

B. umbellata, *Baill. Ét. Euphorb.* 387 (1858). **Kosatta,** *S.*
Thw. Enum. 277. *Codiæum umbellatum*, Muell. Arg. in DC. l. c. 1118. C. P. 3014.
Fl. B. Ind. v. 402. Bedd. Fl. Sylv. Anal. t. 23, f. 6. Wight, Ic. t. 1874 (*Croton umbellatum*).

Shrub or small tree; branches slender, dichotomous; bark smooth, finely lenticellate, young parts glabrous; l. numerous, $2\frac{1}{2}$–$4\frac{1}{2}$ in., oval, acute at base; slightly acuminate, glabrous and shining, dark green; petiole very short, curved; infl. on long terminal peduncles, ped. of male long, filiform, of fem., stout, thickened upwards; sep. in male rounded, in fem. acute; fr. under $\frac{1}{2}$ in., glabrous, lobes very bluntly keeled; seeds oblong, testa shining, mottled.

Moist region, below 1000 ft., and especially on the coast; common. Fl. Nov., Dec.; green.
Also in S. India.

I cannot distinguish *B. calycina*, Benth., to which are referred in Fl. B. Ind. some specimens from Ceylon in Rottler's Herb. Wight's figure above quoted is also referred to it in Fl. B. Ind., and this appears to represent the common Ceylon plant. The Ceylon specimens also in Herb. Rottl. labelled by Sir J. Hooker 'Blachia calycina, G. B.,' do not appear to me to differ from *B. umbellata*.

25. **DIMORPHOCALYX,** *Thw.*

A small tree; l. alt., with stip.; fl. diœcious (very rarely monœcious), moderate-sized, male in clusters on old wood, fem. solitary or 2 or 3 together, terminal or leaf-opposed; male fl..—cal. cup-shaped, shallow, membranous, nearly truncate or with 5 very shallow segm. or teeth; pet. 5, erect, recurved in upper part, imbricate; stam. 10, in two rows, outer shorter, fil. connate below into a column; disk of 5 scale-like glands; pistillode 0; fem. fl.:—cal. large, divided nearly to base into 5 oblong-lanceolate, obtuse segm.; pet. as in male, but rather larger; ov. 3-celled, with one ovule in each cell; disk annular; styles 3, bifid; fr. a capsule, of three 2-valved crustaceous cocci, surrounded at base by persistent cal., capped with styles; seeds ovoid, testa crustaceous, endosperm fleshy, cotyledons broad, flat.—Sp. 5; all in *Fl. B. Ind.*

D. glabellus, *Thw. Enum.* 278 (1861). **Weliwenna,** *S.* **Téntukki,** *T.* [PLATE LXXXIV.]

Trigonostemon Lawianus, Muell. Arg. in DC. l. c. 1105 (in part). C. P. 1046.

Fl. B. Ind. v. 403.

A small, much-branched tree; twigs slender; bark cinnamon-grey; young parts glabrous; l. 3–4½ in., lanceolate or oblong-lanceolate, tapering to base, acuminate, subacute, entire or slightly repand-dentate, glabrous, dull dark green, paler beneath; petiole ½ in.; stip. small, triangular; fl. few, stalked; cal.-segm. of male much shorter than pet., of fem. much longer than pet., rather unequal, parallel-veined, each with a rounded gland on back at apex; fr. under ½ in., pubescent.

Dry region; very common. There are also specimens in the Herbarium from Galle and Kalutara in the moist region. Fl. July, Aug.–Feb.; white.

Also in S. India (?).

The male and female fl. are so different that the plants are constantly collected as different species. The young branches are often strongly ridged with thick lines of cork. Very near *D. Lawianus,* Hk. f. of Western India (=*D. glabellus,* Bedd. in Trans. Lin. Soc. xxv. t. 26, reprod. in Fl. Sylv. t. 273), but I think distinct.

26. **AGROSTISTACHYS,** *Dalz.*

Shrubs or small trees; l. simple, thick, erect, strongly penniveined; fl. small or minute, diœcious, in small spikes or long racemes; male fl.:—solitary or in small clusters, globose;

sep. 2–5, irregular, valvate; pet. 5–8; disk of 5 glands; stam. 8–13, on a convex receptacle, distinct, anth. versatile; pistillode small; fem. fl.:—sep. 2–4; pet. usually 5; disk large; ov. 3-celled, with one ovule in each cell, styles 3, bifid; fruit a strongly tricoccous capsule; seeds nearly globose, testa crustaceous, endosperm fleshy, cotyledons broad, flat.—Sp. 8; 6 in *Fl. B. Ind.*

There appear to be two genera here, and *Sarcoclinium* should be maintained.

Leaves strongly serrate . . . . 1. A. INDICA.
Leaves entire or nearly so (*Sarcoclinium*).
  Stip. very large, lanceolate attenuate . . . 2. A. HOOKERI.
  Stip. small, broadly triangular . . . . . 3. A. LONGIFOLIA.

1. **A. indica,** *Dalz. in Kew Journ. Bot.* ii. 41 (1850).
Thw. Enum. 279. Muell. Arg. in DC. l. c. 726 (excl. var. β). C. P. 2156.
Fl. B. Ind. v. 406. Bedd. Ic. Fl. Ind. or t. 241.

Shrub, 5–6 ft.; branches stout; young parts glabrous; l. numerous, 5–11 in., linear-lanceolate, gradually tapering into short petiole, acute, coarsely and sharply serrate with incurved teeth, thick, glabrous; male fl.:—minute, solitary in axils of very small bracts arranged to form little grass-like spikelets clustered in or above the l. axil, bracts finely ciliate; fem. fl. similarly arranged; pet. 6–8; stam. 8–13, longer than pet.; capsule scarcely $\frac{1}{2}$ in., strongly 3-lobed, glabrous, red; seeds ovoid-globose, pale brown.

Low country, to 2000 ft.; rather rare. Deyandera, S. Prov.; Balangoda; Kurunegala; Kaduganawa; Haragama; Maturata. Fl. Sept.; white.
Also in S. India.
The leaves vary much in width and size.

2. **A. Hookeri,** *Benth. in Gen. Plant.* iii. 303 (1880). **Maha-béru, Duja-béru,** *S.*
Sarcoclinium Hookeri, Thw. Enum. 279; Muell. Arg. in DC. l. c. 727. C. P. 3429.
Fl. B. Ind. v. 406.

A small tree, very slightly branched; stems thick, smooth, marked with large scars of petioles and stip.; l. rather crowded, very large, 18–24 in., linear-lanceolate, much tapering to base, very shortly acuminate, subacute, shallowly serrate in upper part, glabrous, leathery, midrib very prominent; petiole about 1 in., much thickened at base, flat on top; stip. very large, 2–2$\frac{1}{4}$ in., narrowly triangular, attenuate, pungently acute, papyraceous, brownish-yellow; male fl. not seen; fem. fl. moderate-sized, on long thick horizontal ped., jointed near

base in lax very elongated racemes, often exceeding l.; sep. 4, short, rounded, reflexed; ov. pubescent, styles stout, very shortly bifid; capsule about 1 in., glabrous.

Moist region, below 1000 ft.; very rare. Near Marai-Kalai; Kundugama; Eknaligoda; Ratnapura Dist. Fl. April.

Endemic.

The foliage is very handsome.

3. **A. longifolia,** *Benth. in Gen. Plant.* iii. 303 (1880). **Béru,** *S.*

Sarcoclinium longifolium, Wight; Thw. Enum. 279. Muell. Arg. in DC. l. c. 727. C. P. 596.

Fl. B. Ind. v. 407. Wight, Ic. tt. 1887–8.

A shrub; branches stout, marked with scars of petioles and stip.; young parts glabrous, resinous; l. numerous, crowded at end of branches, usually 4–9 in. (occasionally much longer, up to 2 ft.), obovate-oblong, attenuate at base into obscure petiole, very shortly acuminate, obtuse, entire, glabrous, very stiff and leathery; stip. short, broad, acute, caducous; fl. in lax spicate racemes, shorter than l., male in clusters of 1–4 in axil of single bract, fem. fewer, more lax, on longer ped., solitary; male fl.:—sep. 2 or 3; pet. 5, small; disk-glands large; stam. about 10; fem. fl.:—sep. 5; pet 5; disk very large, lobed; styles spreading; capsule small, $\frac{3}{8}$ in., glabrous; seeds globose.

Montane zone, 3–600 ft., common. Fl. Feb., March, and Sept.

Also in S. India and Malay Peninsula.

The stiff, hard, leathery leaves are used for roofing dwellings, like shingles, and are remarkably durable; young shoots resinous.

27. CHROZOPHORA, *Neck.*

Annual, covered with stellate hairs; fl. monœcious, in axillary racemes; male fl.:—cal. globose, segm. 5, valvate; pet. 5; disk obscure; stam. 12–15, fil. connate; pistillode 0; fem. fl.:—cal. and pet. of the male; ov. densely stellate-tomentose, 3-celled, with 1 ovule in each cell, styles 3, bifid; fr. a tricoccous capsule, hispidly tomentose with stellate hair; seeds nearly globose, testa rough, shining, endosperm fleshy, cotyledons broad, flat.—Sp. 6; 3 in *Fl. B. Ind.*

1. **C. plicata,** *A. Juss. Tent. Euphorb.* 28 (1824).

C. Rottleri, A. Juss.; Thw. Enum. 443. C. P. 3854.

Fl. B. Ind. v. 409. Burm. Fl. Ind. t. 62, f. 1. (poor.)

Annual herb; stems prostrate, stout, divaricately branched, covered, especially when young, with stellate hairs; l. numerous, 1–1½ in., spreading, rotundate-ovate, usually acute at base,

rounded at apex, crisped at margin, shallowly lobed, rough with stellate hairs above, soft and white with more copious stellate hairs beneath, veins prominent beneath, impressed above; petiole $\frac{1}{2}$–$\frac{2}{3}$ in., with 2 small glands at the summit; racemes very shortly stalked, male fl. sessile in upper part, fem. fl. on curved ped. in lower part, all stellately hairy.

Dry region, very rare. Nilavelly, near Trincomalie, 1864 (Glenie). Throughout India and westward to Mediterranean region and Spain.

28. ACALYPHA, *L.*

Herbs or shrubs; l. alt., petiole long; fl. minute, apetalous, monœcious, mixed in axillary spikes, fem. surrounded by large persistent bracts at base; male fl.:—sep. 4, valvate; disk 0; stam. 8, on a convex receptacle, usually distinct, anth.-cells divaricate; pistillode 0; fem. fl.:—sep. 3–6, imbricate; ov. 3-celled, with one ovule in each cell, styles 3, usually much divided into several long slender branches; fr. a very small capsule of three 2-valved crustaceous cocci; seeds subglobose, testa crustaceous.—Sp. 220; 9 in *Fl. B. Ind.*

Shrubs.
- Bracts, minute . . . . 1. A. PANICULATA.
- Bracts, large toothed . . . . . . 2. A. FRUTICOSA.

Annual herbs.
- Bracts, shortly dentate-truncate . . . 3. A. INDICA.
- Bracts, 3-lobed . . . . 4. A. BRACHYSTACHYS.
- Bracts, deeply toothed . . . . . . 5. A. LANCEOLATA.
- Bracts, fimbriate . . . . 6. A. CILIATA.

1. **A. paniculata,** *Miq. Fl. Ind. Bat.* i. ii. 406 (1859).
A. Wallichii, Thw. Enum. 271. Muell. Arg. in DC. l. c. 802 C. P. 2096.
Fl. B. Ind. v. 415. Rheede, Hort. Mal. x. t. 83.

A small shrub, much branched; branches virgate, divaricate, ascending; young parts pubescent; l. numerous, alt., $1\frac{1}{4}$–3 in., ovate or oblong-ovate, rounded at base, acuminate, acute, strongly serrate, sparsely hairy on both surfaces, thin; petiole various, often as long or longer than l., spreading or deflexed, slender, pubescent; stip. minute, subulate; fl. minute, monœcious; male sessile in small clusters on very slender, rather dense fld., ascending, axillary spikes; fem. shortly ped., on branches of large, erect, very lax, slender, terminal panicles; bracts minute, inconspicuous; male fl.:—stam. 8; fem. fl.:—sep. 5, linear, very acute, glandular-hairy; styles long, erect, with many filiform, twisted branches; capsule very small, 3-lobed, strongly glandular-hairy.

Shady places in the moist region 2000–4000 ft.; rather common. Matala; Kadaganawa; Ramboda; Badulla; Nitre Cave Dist. Fl. Jan., Feb., Sept.; pinkish green.

S India, Java, Trop. Africa.

2. **A. fruticosa,** *Forsk. Fl. Ægypt.-Arab.* 161 (1775).

A. betulina, Retz. Obs. Bot. v. 30; Moon, Cat. 65; Thw. Enum. 271. C. P. 2094.

Fl. B. Ind. v. 415.

A low shrub, very much branched; branches slender, virgate, spreading or ascending, glabrous; young parts scurfily pubescent; l. numerous, but rather distant, $\frac{3}{4}$–2 in., oblong or rhomboid-ovate, acute at base, shortly acuminate, coarsely or finely crenate-serrate, glabrous, with small, punctiform, orange, scattered glands beneath; petiole $\frac{1}{4}$–$1\frac{1}{4}$ in., slender; stip. minute, persistent; fl. minute, sessile, on strict ped., in clusters crowded in short axillary spikes, male very numerous, with minute bracts; stam. 8; fem. 2 or 3 at base of spikes, each with toothed bracts; styles 3, split into many filiform segments; capsule with 3 rounded lobes, densely pubescent.

Dry region, rather rare. Puttalam; Uma-oya; Mantai, Aripo; Kirinda, abundant; also at Matale. Fl. Dec.–April, Aug.; greenish-white.

S. India, Burma, Arabia, Trop. Africa.

First noticed by Kœnig; Moon's locality is Wellasse. Often gregarious and in great quantity, as on the site of the ancient city of Tirukeltisvaram, Mantai. The leaves are fetid when bruised. The young spikes before expansion are very like the catkins of the birch, and this, coupled with the similarity in foliage, accounts for Retzius' name, *betulina*.

3. **A. indica,** *L. Sp. Pl.* 1003 (1753). **Kuppamiénya,** *S.* **Kuppaméni, Punairananki,** *T.*

Herm. Hort. Lugd.-Bat. 686; Mus. 2. Burm. Thes. 203. Fl. Zeyl. n. 341. Moon, Cat. 65. Thw. Enum. 271. C. P. 2098.

Fl. B. Ind. v. 416. Herm. Hort. Lugd.-Bat. t. 687. Wight. Ic. t. 877.

Annual herb, 1–$2\frac{1}{2}$ ft., erect; branches numerous, long, ascending, angular, finely pubescent; l. $1\frac{1}{2}$–3 in., rhomboid-ovate, tapering at base, acute, serrate, glabrous, thin, somewhat 3-nerved at base, pale green; petiole usually longer than l., slender, spreading; stip. minute; fl. sessile, in numerous, lax, erect, axillary spikes, male very small, clustered near summit; stam. 8; fem. solitary, scattered, each with a large, leafy, truncate, dentate bract; ov. hispid; capsule small, quite concealed by enlarged bract.

Cultivated and waste ground in the low country, especially in dry region; a common weed. Fl. all the year; green.

Tropical Asia and Africa generally.

4. **A. brachystachya,** *Hornem. Hort. Hafn.* 909 (1815).
Fl. B. Ind. v. 416.

A herbaceous annual, 6–12 in., flaccid, nearly glabrous; l. 1–3 in., long-petioled, ovate or cordate, acute, obtuse, or acuminate, crenate-serrate, thin; petiole often longer than the blade; spikes all axillary, sessile, very short, androgynous; male fl. very few, in minute clusters at the top of the spike; bracts $\frac{1}{4}$–$\frac{1}{2}$ in.; fem. in clusters, crowded at the base of the spike; bracts very large, cut into 3 linear spreading 1-nerved obtuse lobes, 2–3-fid.; styles pectinately laciniate; capsules quite concealed by the large green bracts; seeds subglobose, nearly smooth.

Ceylon, Mrs. Walker (Herb. Kew).
India, Java, Trop. Africa.
Looks like a *Triumfetta.*

5. **A. lanceolata,** *Willd. Sp. Pl.* v. 524 (1805).
Burm. Thes. 204. Fl. Zeyl. n. 342. *A. virginica,* L. Sp. Pl. 1003 (in part); Moon, Cat. 65. *A. hispida,* Thw. Enum. 271 (non Burm.). *A. fallax,* Muell. Arg.; Trim. Syst. Cat. 82. C. P. 2092, 2097.
Fl. B. Ind. v. 416. (*A. fallax*). Plukenet, Phytogr. ii. t. 99, f. 4. Burm. Thes. t. 93, f. 1?

Annual, much branched from base; branches prostrate or ascending, glabrous or somewhat hairy; l. small, $\frac{1}{2}$–$1\frac{1}{4}$ in., ovate-lanceolate, rounded or acute at base, acute at apex, serrate, glabrous or slightly hairy, somewhat 3-nerved at base; petiole longer than l., somewhat hairy; spikes very short, sessile; fem. fl. numerous, rather lax; bracts short, hairy, with several deep acute teeth; capsules rather exceeding bracts, hispid.

A weed in the low country; common. Fl. (?)
Also in S. India, Burma, Malaya.
The Ceylon plant is certainly *A. lanceolata, Willd.*, which is the earliest name. Linnæus combined the plant with a N. American species, and his name is thus inapplicable. There is no specimen in Herb. Herm. I am doubtful whether Burmann's figure should be referred to this; it may be a large state.

6. **A. ciliata,** *Forsk. Fl. Ægypt.-Arab.* 162 (1775).
Thw. Enum. 273. C. P. 2095.
Fl. B. Ind. v. 417.

Herbaceous; stem $1\frac{1}{2}$–$2\frac{1}{2}$ ft.; erect, scarcely branched, pilose; l. 1–2 in., oval, acute at base, acuminate, subacute, finely serrate, thin, hairy on veins beneath; petiole longer than l., spreading, slender; spikes short, $\frac{1}{2}$ in.; male fl. few, sessile, very minute; fem. several, crowded at base of spike;

bracts large, very concave, pubescent, fimbriate, with numerous setaceous teeth; capsule concealed by bracts, glabrous, nearly white.

Dry country, rather rare. Uma-oya; Tissamaharama, abundant; Batticaloa. Fl. Dec.–March; greenish.
India, Arabia, Tropical Africa.

29. **ADENOCHLÆNA,** *Boiv. ex Baill.*

A shrub; l. alt. with stip; fl. monœcious, male numerous, densely clustered, fem. few at base of same infl.; male fl.:—cal. globose, segm. 4 or 5, obtuse, valvate; stam. 4 or 5, distinct; disk 0; pistillode columnar; fem. fl. much larger; per.-segm. 6, linear, acute, persistent, enlarged, and pectinately multifid in fr.; ov. 3-celled, with 1 ovule in each cell, styles very large, deeply 3-cleft, with the arms copiously laciniate; capsule 3-lobed, slightly depressed, surrounded by the pectinate sepals; seeds subglobose, testa crustaceous, marbled.—Sp. 4 or 5; 3 in *Fl. B. Ind.*

The only Ceylon species is, I think, a good endemic genus (*Centrostylis*, Baill.).

1. **A. Zeylanica,** *Thw. Enum.* 270 (1861). [PLATE LXXXV.]
Centrostylis zeylanica, Baill. Ét. Gen. Euphorb. 470. *Cephalocroton zeylanicus*, Baill.; Muell. Arg. in DC. l. c. 419. C. P. 396 (2111).
Fl. B. Ind. v. 419. Baill. Ét. Gen. Euphorb. 470, t. 2, f. 28, 29.

An erect slightly branched bush, rough on the young parts, hoary with minute stellate hairs; l. 3–5 in., narrowly ovate, rounded at base, elongate-acuminate, acute at apex, entire, slightly rough with stellate hair, especially beneath; petiole ½–1 in.; stip. subreniform, deciduous; fl. shortly stalked, crowded in short terminal or leaf-opposed stalked racemes, the male crowded at top, the fem. few at base, buds of male fl. globose; ped. and per. densely stellate-tomentose; fruiting per. segm. ¾ in., much exceeding capsule, pectinate, branches filiform-setaceous, thickened at the tips, purple; capsule stellate-pubescent; seeds subglobose, ⅙ in. diam., brown marbled with black.

Montane zone, 3000–5000 ft., rare. Pusselawa; Hantane; Haputala; Ella Pass. Fl. May, Sept; styles red.
Endemic.

30. **TREWIA,** *Linn.*

A tree; l. opp., entire; fl. moderate-sized, apetalous, diœcious, in axillary pendulous racemes, male numerous, fem.

very few; male fl. globose; sep. 3 (or 4), valvate in bud; stam. numerous (over 20), distinct, anth. oblong; pistillode 0; fem. fl.:—cal. split down on one side, caducous; ov. 3- or 4-celled, with 1 ovule in each cell, styles 3, long, filiform, free to the base, papillose; fr. globose, hard, indehiscent; seeds 3 or 4, ovoid, testa hard.—Sp. 2; both in *Fl. B. Ind.*

T. nudiflora, *L. Sp. Pl.* 1193 (1753).
Thw. Enum. 272. Muell. Arg. in DC. l. c. 953. C. P. 2930.
Fl. B. Ind. v. 423. Wight, Ic. tt. 1870, 71. Bedd. Fl. Sylv. t. 281.

A moderate-sized tree; bark smooth, marked with leaf-scars; branchlets stout; young shoots finely stellate-tomentose; l. opp., 6–7 in., ovate, cordate at base, entire, acuminate, glabrous above, finely stellate-hairy on veins beneath, thin, bright green, somewhat 3-nerved at base; petiole cylindrical, 2–3 in., finely pubescent; stip. minute, acute, soon falling; male fl. on slender horizontal ped., racemes spicate, 4–6 in., buds globose; sep. valvate, concave; fem. fl.:—ov. globose, densely stellate-hairy, style thick, erect, stigmas very long, $\frac{1}{2}$–$\frac{3}{4}$ in.; fr. about $\frac{1}{2}$ in., roughish with scattered stellate hairs; seed broad, brown.

Dry country, rare; Uma-oya. Fl. May, Oct.; pale green.
Also India and Malaya.
Wood white, soft, not durable.

31. **TRAGIA,** *Linn.*

An evergreen twiner, hispid, with stinging hairs; l. entire, 3-lobed or 3-partite; fl. monœcious, apetalous, in terminal axillary and leaf-opposed racemes, male superior, fem. inferior; bracts small or very minute; male fl.:—cal. globose, valvately 3-partite; stam. 3, fil. distinct; pistillode 0, or 3-fid.; fem. fl.:—sep. 6, imbricate in bud, entire or pinnatifid, accrescent; ov. 3-celled, ovules 1 in each cell; styles entire, united in a column below; capsule of 3 2-valved cocci; seeds globose, estrophiolate, testa crustaceous, endosperm fleshy, cotyledons broad.——Sp. about 50; 3 in *Fl. B. Ind.*

T. involucrata, *L. Sp. Pl.* 980 (1753). **Wel-kahambiliya,** *S.*
Herm. Mus. 18. Burm. Thes. 202. Fl. Zeyl. n. 340. Moon, Cat. 62. Thw. Enum. 270. C. P. 2099, 2951.
Fl. B. Ind. v. 465. Burm. Thes. t. 92.

Stem elongate, slender, twining; l. 1–4 in., very variable, from linear-oblong to broadly ovate-cordate, acuminate,

serrate, membranous, from entire to deeply 3-fid or 3-partite, with irregularly serrate or subpinnatifid lobes; petiole long or short; racemes 1–2 in., with many male and few fem. fl., slender; male fl. shortly pedicelled; fem. fl. strigosely hispid; sep. rigid, entire or pinnatifid, stellately spreading, and ¾ in. diam. in fr.; ov. hispid, style columnar, variable in length; capsule ⅓ in. diam., more or less hispid; seeds globose.

Var. β, **cordata,** *Muell. Arg. in DC. l. c.* 943. Var β, *montana,* Thw. Enum. 270. *T. montana,* Muell. Arg. l. c. 944. C. P. 2100, 3519.

L. ovate-cordate, cuspidately acuminate, coarsely serrate.

Var. γ, **cannabina,** *Hk. f. T. cannabina,* L. f.; Thw. Enum. 270.
Var. ε, *intermedia,* Muell. Arg. l. c. 944. C. P. 3569. Pluk. Phytogr. t. 120, f. 6.

L. all palmately 3-partite, with narrow, toothed, or pinnatifid segments.

Waste ground in low country, common. Var. β in montane zone; Hantane; N. Eliya. Var. γ, dry region only; Anuradhapura; Mineri. Fl. Feb., March.
India, Burma, China.
Very variable in habit and in form of leaf. It stings sharply.

32. PODADENIA, *Thw.*

A large tree; l. entire, penninerved; fl. diœcious, apetalous, in large terminal panicles; male fl. globose; sep. 3, valvate; stam. over 20, distinct; no pistillode; fem. fl.:—sep. 3–5, imbricate; ov. exserted, strigose, 3-celled, with one ovule in each cell, styles 3, long, filiform, undivided, twisted; fr. large, fleshy, indehiscent, covered with large stalked glandular processes; seeds usually only 2 or 1, each completely enveloped in a fleshy white aril, testa bony, grey, endosperm copious.—Monotypic.

The only genus of *Euphorbiaceæ* confined to Ceylon.

P. sapida, *Thw. Enum.* 274 (1861).
Rottlera Thwaitesii, Baill. Ét. Gen. Euphorb. 426. *P. Thwaitesii,* Muell. Arg. in DC. l. c. 791. C. P. 3428.
Fl. B. Ind. v. 423. Bedd. Fl. Sylv. t. 282.

A large tree; branchlets stout, fulvous-tomentose; young parts silky tomentose; l. 5–9 in., oval, acute at base, very shortly acuminate, acute, entire, glabrous above, except on the veins, more or less hairy beneath on the veins; petiole 1–1¼ in., stout, tomentose; fl. pedicelled; male in clusters; fem. solitary,

on large glandular-pubescent terminal panicles, rather exceeding the l.; bracts linear, leafy; male fl. numerous, buds pointed, glandular; fem. fl.:—sep. very acute, reflexed, glandular; styles acute, united, deep crimson; fr. about 2 in., more or less globose, beaked, red, thickly set with large stalked spherical glands.

Moist region below 2000 ft., very rare. Marai-kelai, Kandagama, near Ratnapura; Ambagamuwa. Fl. April; crimson-red.

Endemic.

I have seen only the C. P. specimens of this remarkable plant, collected in 1855, by Thwaites, who states that the aril of the seed has an agreeable taste.

33. CLAOXYLON, *A. Juss.*

Shrubs or herbs; l. alt.; fl. minute, usually diœcious, apetalous, in long axillary racemes; male fl.:—cal. subglobose, valvate, 3- or 4-partite; stam. 5–14, fil. distinct, often mixed with stalked bodies, anthers erect, adnate to the top of the fil.; pistillode 0; fem. fl.:—sep. as in the male; disk of 3 linear petal-like scales; ov. 3-celled, with one ovule in each cell, styles 3, not bifid, fringed; fr. a small tricoccous capsule, cocci nearly globose; seeds subglobose, estrophiolate, testa crustaceous, endosperm fleshy, cotyledons broad.—Sp. 40; 15 in *Fl. B. Ind.*

Herb, l. under 3 in. . . . . . 1. C. MERCURIALIS.
Shrub, l. over 4 in. . . . . . 2. C. OLIGANDRUM.

1. **C. Mercurialis,** *Thw. Enum.* 271 (1861).

Burm. Thes. 205. Fl. Zeyl. n. 334. *Tragia Mercurialis*, L. Sp. Pl. 980. Moon, Cat. 62. *Micrococca Mercurialis*, Benth., ex Trim. Syst. Cat. 82. C. P. 3310.

Fl. B. Ind. v. 412. Plukenet, Phytogr. t. 205, f. 4.

Annual, 12–18 in., erect, with few ascending branches, glabrous; l. numerous, spreading, 1–2¼ in., lanceolate and oval-lanceolate, acute at base, subacute at apex, serrate-crenate, glabrous, thin; petiole ½–1 in., slender; racemes numerous, very slender, usually longer than the l.; fl. distinct, few; male fl.:—stam. variable, usually 5–10; fem. fl.:—ov. hairy; capsule very small, of 3 ovoid nearly distinct hairy cocci.

Low country, a common weed in cultivated ground. Fl. May, July.

Also in India, Burma, Arabia, Trop. Africa.

The genus *Micrococca*, Benth., was rightly reduced by Thwaites to *Claoxylon*.

2. **C. oligandrum,** *Muell. Arg. in Linn.* xxxiv. 104 (1865).

C. longifolium, Baill. Ét. Euphorb. 493 (in part); Thw. Enum. 271. C. P. 2102.

Fl. B. Ind. v. 412.

A shrub; branches slender, virgate; bark very smooth, pale grey; young parts slightly puberulous; l. 5–7 in., linear-lanceolate, tapering to base, acuminate, acute, irregularly dentate-serrate; petiole 1–2½ in.; racemes very lax and slender, as long as l.; male fl. minute, in little spikelets, fem. fl. solitary; male fl.:—stam. 10–14, mixed with stalked stellate processes; fem. fl.:—ov. silky, styles thick, recurved; fr. very small, cocci globose.

Moist region in forests, 2000–5000 ft., rather rare. Matale; Deltota; Maskeliya; Maturata. Fl. March–Sept.

Endemic.

Muell. Arg. has a variety *depauperatum* with the male flowers very distant, and with only 5-8 stamens.

34. MALLOTUS, *Lour.*

Trees or shrubs; l. alt. or opp., often gland-dotted; fl. small, apetalous, diœcious (very rarely monœcious), in axillary or terminal spikes, racemes, or panicles; male fl. globose or ovoid; sep. 3–5, valvate; stam. numerous, distinct, anth. cells small, often widely separated; pistillode 0; fem. fl.:—cal. deeply 3–5-lobed, valvate; ov. 2- or 3-celled, with 1 ovule in each cell; styles short, entire, papillose; fr. a 3- or 2-lobed capsule, often softly spinous; seeds nearly globose, testa crustaceous, endosperm fleshy, cotyledons broad.—Sp. 70; 45 in *Fl. B. Ind.*

Capsule with spines.
- L. silvery-white, with scales beneath . . . 1. M. ALBUS.
- L. softly stellate-pubescent . . . . . 2. M. ERIOCARPUS.
- L. glabrous . . . . 3. M. WALKERÆ.

Capsule without spines.
- Capsule stellate-pubescent . . . . . 4. M. RHAMNIFOLIUS.
- Capsule glabrous . . . . 5. M. FUSCESCENS.
- Capsule stellate-tomentose.
  - L. opp., carp. 3 . . . . 6. M. DISTANS.
  - L. alt. carp. 2 . . . . 7. M. REPANDUS.
- Capsule with red scurfy powder . . . 8. M. PHILIPPINENSIS.

1. **M. albus,** *Muell. Arg. in Linn.* xxxiv. 188 (1865). **Búkenda,** *S.*

Croton moluccanum, Moon, Cat. 65 (non. L.) *Rottlera** *tetra-*

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* *Rottlera*, Roxb., commemorates the venerable botanist and missionary, Dr. John Rottler, of Madras. He visited Ceylon in 1788; and in 1795-96 accompanied, as naturalist, Mr. Cleghorn, Secretary to Lord North, down the East Coast, collecting largely. His specimens are now in the Kew Herbarium. He died in 1836 at the great age of 87.

cocca, Roxb.; Thw. Enum. 272. Muell. Arg. in DC. l. c. 965. C. P. 2118).
Fl. B. Ind. v. 429. Wight, Ic. t. 1873 (*Rottlera peltata*).

A tree, 30–40 ft.; branchlets rather stout; bark yellowish grey, smooth; young parts rough with brownish stellate hairs; l. numerous, variable, 4–6 in., oblong-oval, often somewhat rhomboidal, sometimes broader than long, narrowed to a cordate or rounded base, or slightly amplexicaul, acute, usually entire, but sometimes with larger teeth, rather thin, glabrous (when mature), dark green above, silvery white with a fine pellicle of minute scales beneath; petiole 3–4 in., slender, thickened at both ends, finely scaly, set with a few irregular glands and a pair of larger circular ones at the summit; stip. ¼ in., subulate, stellate hairy; spikes panicled, stellate-pubescent, terminal fl. male in distant clusters, fem. very shortly stalked, crowded; sep. densely stellate-pubescent; styles short, plumose; capsule under ½ in., thickly set with soft woolly spines, capped with black persistent styles; seeds black.

Moist low country to 2000 ft.; very common.
Fl. April, May.
E. Bengal, S. India, Burma.
The Fl. B. Ind. distinguishes the S. Indian and Ceylon plant as var. *occidentalis*, and as having larger and more effuse fem. panicles and capsules, with longer denser spines.

2. **M. eriocarpus,** *Muell. Arg. in Linn.* xxxiv. 185 (1865).
Rottlera eriocarpa, Thw. Enum. 273. Muell. Arg. in DC. l. c. 959. C. P. 2112.
Fl. B. Ind. v. 432.

A shrub; branches slender, covered with fulvous-stellate pubescence, young parts densely so; l. 2–6 in., variable in form, rhomboid-ovate, ovate, or ovate-oblong, rounded at base, more or less acuminate acute or obtuse, irregularly and faintly dentate, softly and finely stellate-pubescent on both surfaces, veins prominent beneath; fl. on short ped, in clusters on axillary spicate racemes shorter than l., stellate-tomentose, buds pointed; sep. 3, recurved, densely stellate-pubescent; ov. densely tomentose, with a ring of abortive stam. round base, styles very hairy; capsule over ½ in., cocci nearly distinct (often only 2), thickly covered with long very hairy processes.

Dry region; rather common. Anuradhapura, abundant; Dambulla; Uma-oya. Fl. July; reddish.
Endemic.

M. moluccanus, Muell. Arg. (*Croton moluccanus*, L. in part), does not occur in Ceylon (see under *Givotia*).

3. **M. Walkeræ,** *Hk. f. in Fl. B. Ind.* v. 437 (1887).
Rottlera muricata, Thw. Enum. 273. *M. muricatus*, Muell. Arg. in DC. l. c. 972 (in part). C. P. 2108.
Fl. B. Ind. v. 437.

A small tree; young parts glabrous, usually glandular and sticky; l. often opp., variable, 3–7 in., oblong-lanceolate or slightly rhomboid, acute or obtuse at base, more or less acuminate, acute, entire or sinuate or shallowly dentate or serrate, glabrous, thickly sprinkled beneath with minute circular glands; petiole short; stip. triangular, acute; male fl. in short racemose clusters or spikes, fem. solitary on bracteate ped., or in leaf-opposed racemes; ov. pubescent and with large blunt processes, styles short; capsule about ½ in., strongly 3-lobed, slightly puberulous, with long, soft, spinous processes which are deciduous.

Moist and dry regions, and up to 4000 ft.; rather common. Kalutara; Hewesse; Dambulla; Uma-oya; Hantane; Maturata. Fl. March–May, September; greenish-white.

Endemic.

This is allied to the true *M. muricatus*, Bedd. (part), which is S. Indian only, and figured in Wight, Ic. t. 1886 (as *Claoxylon muricatum.*)

4. **M. rhamnifolius,** *Muell. Arg. in Linn.* xxxiv. 196 (1865).
Marai-tium, *T.*
Croton reticulatus, Willd. Sp. Pl. iv. 545. *Rottlera oppositifolia*, Thw. Enum. 272 (non Bl.). *M. zeylanicus*, Muell. Arg. in DC. l. c. 977, and *M. micranthus*, Muell. Arg. in DC. l. c. 971. C. P. 196 (2106).
Fl. B. Ind. v. 440.

A shrub or small tree; bark smooth, yellowish; young parts slightly fulvous-pubescent; l. opp. or alt., 3–6 in. (rarely more), oblong-oval, acute or rounded at base, subulate at apex, entire, glabrous, venation prominent beneath, often somewhat 3-nerved at base, with scattered, very minute, yellow, circular scales on lower surface; petiole ½–1 in., slender; fl. spikes usually exceeding l.; male fl. in clusters, fem. solitary; stam. very numerous, anth.-cells distant; ov. stellate-hairy; fr. ⅓ in., cocci globose, almost distinct, finely stellate-pubescent.

Var. (?) β, *ovatifolius*, *Hk. f. in Fl. B. Ind.* v. 440.

L. smaller, ovate, acuminate, base broader, rounded, veins 2–3 from above the basal.

Low country, up to 3000 ft., chiefly in the moist region; common. Fl. Dec.–Mar.; whitish. Var. β, Balangoda (Thwaites).

Also in S. India.

There are specimens in Rottler's Herb. from 'Cocklai, Jan. 23,' and 'Trincomalie, Jan. 28, 1796,' labelled *Croton reticulatum*, Willd., which name is thus fixed for the Ceylon plant.

Very variable in foliage. Var. β is scarcely worth notice.

5. **M. fuscescens,** *Muell. Arg. in Linn.* xxxiv. 195 (1865).
Rottlera fuscescens, Thw. Enum. 273. Fl. Zeyl. n. 432 (Nelughas). Muell. Arg. in DC. l. c. 978. C. P. 2105.
Fl. B. Ind. v. 441.

A small tree; young parts glabrous but glandular; l. 3–5 in., opp. or alt., oval or oblong-oval, acute or slightly rounded at base, shortly acuminate, obtuse, entire, glabrous, rather thick; male fl. shortly stalked, minute, crowded in numerous short rufous-pubescent axillary and terminal spikes; fem. on longer ped. in more lax racemes; styles rather long, recurved; capsule $\frac{1}{3}$ in., glabrous, but somewhat glandular.

Moist region to 2000 ft.; rather common. Galle; Mawarelle, S. Prov.; Kalutara; Ambagamuwa.
Fl. Feb., March.; pale green.
Endemic.
Hermann's specimens are clearly this, but were not named by Linnæus. It was also collected by Thunberg.
Very near to *M. rhamnifolius*; and there is some mixture of these two under C. P. 2105.

6. **M. distans,** *Muell. Arg. in Linn.* xxxiv. 194 (1865).
Fl. B. Ind. v. 441.

A shrub; branches scurfily stellate-tomentose; l. 6–10 in., opp. in distant pairs, ovate or oblong, very variable, long petioled, acuminate, entire or obscurely sinuate, base connate, rounded, or cordate, thin, or the older coriaceous, glabrous above, stellate-tomentose without glands beneath; racemes axillary, male short, fem. few, elongate in fr.; capsule $\frac{1}{3}$ in., unarmed, densely stellate-tomentose, yellow.

Dry region; very rare. Trincomalie (Rottler).
Also in S. India.
Rottler's specimens are labelled '*Croton distans*, Nob.' No one else seems to have collected it in Ceylon. The description is from Fl. B. Ind.

7. **M. repandus,** *Muell. Arg. in Linn.* xxxiv. 197 (1865).
Croton rhombifolius, Willd. Sp. Pl. iv. 555; Moon, Cat. 65. *Rottlera rhombifolia*, Thw. Enum. 272. C. P. 2115.
Fl. B. Ind. v. 442.

A large shrub or small tree; twigs numerous, slender, finely stellate-pubescent; l. numerous, alt., 2–4 in., broadly deltoid or rhomboid-ovate, very slightly peltate at base, acuminate, subacute, coarsely dentate-sinuate, with scattered minute stellate scales above, thinly velvety, with pale scattered glands beneath; petiole $1\frac{1}{2}$–2 in., stiff, slender, pubescent, thickened at base; stip. minute; male fl. globose in bud, on short stalks, arranged in lax elongated terminal panicles; bracts shorter than ped., acute; per.-segm. acute,

densely pubescent outside; fem. fl. on long ped.; ov. nearly always 2-celled, styles short, plumose; capsule nearly ½ in., densely covered with stellate tomentum, valves caducous; seeds black.

Intermediate and moist region to 2000 ft.; rather rare. Nalande; Haragama; Ekiriankumbura; Peradeniya. Fl. Jan.-March, Sept.; greenish-yellow.

India, Burma, Malaya, China, New Caledonia.

8. **M. philippinensis,** *Muell. Arg. in Linn.* xxxiv. 196 (1865). **Hamparila,** *S.* **Kapila,** *T.*

Croton punctatus, Retz. Obs. v. 30. *C. coccineus*, Vahl, Symb. Bot. ii. 97. *Rottlera tinctoria*, Roxb.; Moon, Cat. 70; Thw. Enum. 273. C. P. 2103.

Fl. B. Ind. v. 442. Bedd. Fl. Sylv. t. 289. Benth. and Trim. Med. Pl. t. 236.

A moderate-sized tree, much branched; bark smooth; young parts scurfy with fulvous pubescence; l. variable, ovate-lanceolate or linear-lanceolate, 3–7 in., rounded or acute at base, subacute, entire, glabrous when mature, rather stiff, strongly 3-nerved with veins prominent beneath, pale or white and thickly sprinkled with minute crimson glands on lower surface; petiole 1–1½ in., cylindrical, fulvous-pubescent, with 2 very small sessile glands at summit; fl. small, male in clusters, sessile in erect terminal spikes, which are usually several together and often longer than l., buds globose; fem. fl. stalked, in short racemes; male fl.:—cal. densely rusty-pubescent; stam. numerous, much exserted; fem. fl.:—ov. glandular, styles simple, papillose; fr. ⅓ in., lobes rounded, smooth, but covered with a scurf of minute, easily detached, deep red particles; seeds nearly globose, black.

Low country to about 2500 ft. in both moist and dry regions; rather common. Fl. Aug.

India, Burma, Malaya, China, Australia.

The powder of the seeds is medicinally used as an anthelmintic in cases of tape worm, and in the cure of itch. The bark is used as a tanning material. The capsules yield a dye giving a permanent, rich, flame colour.

Cœlodiscus Thunbergianus, Muell. Arg. in DC. Prod. xv. 2, 758, is founded on a plant in the Upsala Herbarium without female flowers or fruit, collected in Ceylon by Thunberg. It is probably a species of *Mallotus*, and possibly a variety of *M. rhamnifolius*. Thunberg collected only on the road from Colombo to Matara, a locality perhaps more thoroughly searched for plants than any other part of Ceylon.

35. CLEIDION, *Bl.*

Small glabrous trees; l. nearly entire; fl. diœcious, apetalous, male in spikes, fem. solitary, larger; male fl.:—sep. 3 or 4,

valvate; stam. very numerous, inserted on a conical receptacle, fil. distinct, anth. 4, locellate; pistillode 0; fem. fl.:—sep. 3–5, imbricate; ov. 2–3-celled, with one ovule in each cell, styles 2–3, each bifid, with long branches; fr. capsular, of 2–3 2-valved cocci; seeds subglobose, testa coriaceous, endosperm fleshy, cotyledons broad.—Sp. 13; 2 in *Fl. B. Ind.*

Petioles long . . . . 1. L. JAVANICUM.
Petioles short . . . . 2. C. NITIDUM.

1. **C. javanicum,** *Bl. Bijdr.* 613 (1825). **Okuru,** *S.*
Thw. Enum. 272. Muell. Arg. in DC. l. c. 987. C. P. 656.
Fl. B. Ind. v. 444. Bedd. Fl. Sylv. t. 272.

A small tree; bark pale yellowish-grey, smooth; young parts glabrous; l. alt. or subopp., 3–6 in., oval or lanceolate, acute at base, shortly acuminate, obtuse, crenate-serrate or nearly entire, glabrous, rather thick, dark green, paler beneath; petiole 1–1½ in., slender, thickened at summit; male fl. very small, shortly stalked, in short terminal spicate racemes, buds globose; fem. much larger, solitary, on long, thick, axillary peduncles; male fl.:—sep. 3 or 4, acute, reflexed; fil. slightly connate at base, anth.-cells short, didymous, connective slightly produced; fem. fl.:—sep. 3–5, imbricate; ov. globose, somewhat 2-lobed; styles 2, very long, each again split into 2 long, spreading, filiform arms; fr. rather large, nearly 1 in. diam., didymous, tipped with persistent styles, lobes nearly globose, each splitting down back into 2 valves; seed nearly ½ in., globose, grey mottled with brown.

Moist region to 2000 ft.; rather rare. Kaduganawa; Hantane. Fl. March; green.

E. Bengal, Burma, S. India, Andaman Is., Java.

The seeds have an aril when young. The fruit is always 2-lobed in Ceylon, as described by all authors; 'tridymous' in Fl. B. Ind. is, no doubt, a misprint for 'didymous.'

2. **C. nitidum,** *Thw. ex Kurz, For. Fl. Burm.* ii. 391 (1877).
Mallotus nitidus, Muell. Arg. in DC. l. c. 979. C. P. 3930 (2469).
Fl. B. Ind. v. 444.

A small tree, with slender branches; bark whitish, marked with leaf-scars; young parts glabrous; l. alt., 3½–6 in., oval, acute at base, shortly acuminate, obtuse, obscurely crenate-serrate, glabrous and shining on both sides, rather thin; petiole very short; male fl. sessile in distant clusters on long, slender, axillary spikes; fem. fl. solitary, on long ped.; sep. short and broad; styles 3, deeply 2-fid; fr. not seen.

Lower montane zone; rare. Deltota; Knuckles Mts. Fl. May and September.

Also in Andaman Is.

Dries a dark brown. The Ceylon materials for this species are imperfect.

36. **MACARANGA,*** *Thouars.*

Large or small trees; l. alt., peltate, glandular beneath; fl. usually diœcious, apetalous, in axillary racemes or branched panicles, male many, minute, fem. one or few under each bract; bracts entire or toothed; male fl.:—sep. 3–4, valvate in bud; stam. 2–14, fil. distinct, anth. 3–4-locellate; pistillode 0; fl. fem.:—cal. 2–4-lobed or toothed or spathaceous; ov. 1–6-celled, cells with one ovule, styles entire; capsule small, of 1–5 2-valved cocci, often glandular or with a waxy coat; seeds globose, testa crustaceous, endosperm fleshy, cotyledons broad.—Sp. 80; 24 in *Fl. B. Ind.*

Bracts minute, stam. 3–8 . . . . 1. M. INDICA.
Bracts broad, toothed, stam. 2–5 . . . . . 2. M. TOMENTOSA.
Bracts minute, stam. 10–14 . . . . . . 3. M. DIGYNA.

1. **M. indica,** *Wight, Ic.* v. 2, 23 (1852). **Vattakanni,** *T.*
Thw. Enum. 428. C. P. 3795.
Fl. B. Ind. v. 446. Wight, Ic. t. 1883 and 1949, f. 2.

A large tree; branchlets stout, glaucous, marked with leaf-scars; young parts with rusty deciduous tomentum; l. 7–10 in., peltate, ovate-orbicular, acute, glabrous above, pubescent and thickly covered with minute dark glands beneath; petiole longer than l., cylindrical, glaucous; stip. ovate, acuminate, caducous; male panicles narrow, fulvous-pubescent; bracts minute, with a large glandular appendage; fem. panicles larger, fl. on long divaricate ped.; male fl.:—stam. 3–8; fem. fl.:—ov. usually 2-celled, styles 2, subulate, recurved; fr. very small, under $\frac{1}{4}$ in., of 2 globose glandular cocci.

Low country, and up to 4000 ft.; common. Fl. April.
S. India, E. Bengal, Andaman Is.

2. **M. tomentosa,** *Wight, Ic.* v. 2, 23 (1852). **Kenda, Pat-kenda,** *S.*

Ricinus Mappa, Moon, Cat. 65 (non L.) Thw. Enum. 274. Muell. Arg. in DC. l. c. 1010. *M. Roxburghii*, Wight, Ic. C. P. 2171.

Fl. B. Ind. v. 448 (*M. Roxburghii*). Wight Ic. t. 817 (*Mappa peltata*), and 1949, f. 1. Bedd. Fl. Sylv. t. 287.

A small tree; branchlets very stout, green with glaucous bloom, when young marked with large leaf- and stip.-scars;

* Madagascar name (?).

l. very large, 9–12 in., broadly ovate, peltate with a round base, acuminate, acute or caudate, entire, glabrous, dark green above, pale beneath, venation prominent beneath, translucent; petiole very long, usually longer than leaf, cylindrical, glabrous; stip. large, ovate, acuminate, reflexed, soon falling; male panicles numerous, finely pubescent; bracts broader than long, toothed; fem. panicles shorter and simpler; male fl. very small; stam. 2–5; fem. fl.:—ov. 1-celled, exserted, densely glandular, styles large, lateral, peltate; fr. small, ¼ in., globose, glabrous, but warted with glands.

Moist region up to 3000 ft.; very common. Fl. Oct.; greenish.
Also in S. India on the western side.
Wight's two names, *tomentosa* and *Roxburghii*, are printed on one page, but the former name comes first there. There are specimens from Kœnig in Mus. Brit.

3. **M. digyna,** *Muell. Arg. in DC. Prod.* xv. 2, 1007 (1866). **Ota, Gal-ota,** *S.*
Claoxylon digynum, Wight, Ic. v. 2, 23. *Rottlera digyna*, Thw. Enum. 273. C. P. 2109.
Fl. B. Ind. v. 453. Wight, Ic. t. 1884.

A small tree with slender branches; bark yellow; young parts glabrous; l. rather small, 3–5 in., lanceolate or linear-lanceolate, not peltate, rounded at base, attenuate-acuminate, acute, entire or slightly undulate at margin, glabrous, dotted with numerous minute glands beneath; petiole 1–2 in., slender; stip. ¼ in., subulate, caducous; male spikes numerous, axillary, very slender; male fl.:—sep. 3; stam. 10–14; fem. fl.:—sep. 4, acute, pubescent; ov. 2-celled, glandular; styles very long, ¼ in.; fr. small, ⅓ in., didymous; cocci globose, almost distinct, glabrous.

Low country; rare. Kalutara (Moon); Pelawatte; Kurunegala. Fl. Sept.; yellow.
Endemic.

M. depressa, Muell. Arg., a Javan and Bornean species, is given for Ceylon in DC. Prod. l. c. 989, on the authority of a specimen of Thunberg's in Herb. Upsala. Not in Brit. Mus.; probably an error of label.

37. **HOMONOIA,** *Lour.*

A shrub; l. linear, covered entirely with minute scales beneath; fl. diœcious, apetalous, in axillary spikes; male globose, sep. 3, valvate; stam. numerous, in dense globose heads, fil. in bundles, anth.-cells divaricate; pistillode 0; fem. fl.:—sep. 5–8, narrow, imbricate, caducous; ov. 3-celled, with one ovule in each cell; styles 3, simple, papillose; fr. very

small, 3-coccous; seeds ovoid, testa crustaceous, with a thin fleshy coat, endosperm fleshy, cotyledons broad.—Sp. 3 or 4; 2 in *Fl. B. Ind.*

H. riparia, *Lour. Fl. Cochinch.* 637 (1790).
Spathiostemon javense, Thw. Enum. 272 (non Bl.). C. P. 651.
Fl. B. Ind. v. 455. Wight, Ic. t. 1868 (*Adelia neriifolia*). Bedd. For. Fr. t. xxiv. f. 1.

A shrub; branches erect, stout, rigid; young parts pubescent; l. numerous, all closely placed, 3–6 in., linear, gradually tapering into a very short petiole, acute, entire, glabrous above, whitish beneath, and copiously dotted with minute circular scales; fl. sessile; spikes numerous, shorter than l.; bracts acuminate; male sep. glabrous; fem. sep. hairy, very acute; ov. densely pubescent; capsule puberulous; seeds globose, yellow.

Low country, and up to 4000 ft. on banks of rivers and streams; rather common, often submerged.
Mahaweli at Peradeniya, &c.; Bintenne; Dimbula. Fl. August.
S. India, E. Bengal, Burma, Cochin China, Andaman Is., Java.
Habit of a willow.

Ricinus communis, L., *Endaru*, S., *Chittamanakku*, T., the Castor-oil plant, is an abundant weed in all parts of the island, though but little cultivated. It is n. 339 of Linnæus's Fl. Zeyl. Though now spread through all tropical and warm temperate countries, it is thought to be African in origin.

38. DALECHAMPIA, *L.*

Stem twining; l. alt., 3 foliolate; fl. clustered, monœcious, apetalous, involucrate, male and fem. together mixed with fleshy scales; invol. bracts large; male fl.:—sep. 4–6, valvate, membranous; stam. 20–30, united in a column or bundle on a convex receptacle; pistillode 0; fem. fl.:—sep. 5–12, narrow, laciniate; ov. 3–4-celled, ovules one in each cell, styles slender, confluent in a column, stigma dilated; capsule of three 2-valved cocci; seeds globose, mottled, estrophiolate, endosperm fleshy, cotyledons broad.—Sp. about 60; 3 in *Fl. B. Ind.*

D. indica, *Wight, Ic.* v. 2, 23 (1852).
D. bidentata, Thw. Enum. 270 (non Bl.). *D. ternata*, var. *zeylanica*, Muell. Arg. l. c. 1241. C. P. 2170.
Fl. B. Ind. v. 467. Wight, Ic. t. 1882.

Stem slender, twining, finely pubescent; l. trifoliolate; petiole ½–3 in., very slender; lflts. acuminate, membranous, pubescent, terminal ovate-oblong, lateral dilated and sometimes lobulate at the base; stip. and stipell., lanceolate; invol.

bracts ½–1 in., acutely 3-lobed, serrate; fl. minute, subcapitate; male fl.:—sep. ovate, acuminate; anth. oblong; fl. fem.:—sep. narrow, rigid, laciniate, segm. subulate with glandular tips; ov. pubescent, stigma sub 3-lobed; capsule ½ in. diam., pubescent, enclosed in the much longer cal. segm.

Climbing over bushes and trees in the dry and intermediate country; very rare. Gonagama on lower Badulla Road (Thwaites); Pallavarayakaddu, Jaffna Dist. Fl. Feb., March.

Also in S. India.

The pendulous hop-like heads of flowers are very ornamental when growing, and the compound gland-tipped hairs on the bracts of the involucre very beautiful. It stings slightly. I have seen no petiolules to the leaflets in Ceylon specimens.

Omalanthus populifolius, Grah., is given by Muell Arg. (l. c. 1144) for Ceylon, on the authority of 'Dahl.' It is a Pacific and Malayan plant, reaching as far west as Penang. I suspect *Sapium sebiferum* may have been mistaken for it here.

39. **GELONIUM,** *Roxb.*

A tree; l. alt. with caducous connate stip.; fl. small, diœcious, apetalous, in axillary clusters; male fl.:—sep. 5, distinct, imbricate; stam. numerous, crowded on a convex receptacle, fil. distinct; pistillode 0; fem. fl.:—sep. 5–6, imbricate; disk membranous; ov. 3-celled, with 1 ovule in each cell, styles 3, bipartite; fr. small, tricoccous; seeds subglobose, testa crustaceous, with a fleshy coat, endosperm fleshy, cotyledons broad.—Sp. 15; 4 in *Fl. B. Ind.*

G. lanceolatum, *Willd. Sp. Pl.* iv. 832 (1805). **Kakkaipalai, Varittula, Potpattai,** *T.*

Suregada angustifolia, Baill. Ét. Euphorb. 396. Thw. Enum. 274. *G. angustifolium*, Muell. Arg. in DC. l. c. 1128. C. P. 2101, 252.

Fl. B. Ind. v. 459. Wight, Ic. t. 1867. Bedd. For. Fl. t. xxii. f. 6.

A tree, much branched; bark grey, smooth, marked with annular scars of stip.; young parts glabrous; l. very variable, usually about 2½–4 in., obovate-oval or obovate-lanceolate, very acute at base, shortly acuminate, obtuse, entire, but sometimes much narrower, and the margin occasionally spinous-serrate, rather thick, glabrous, and shining; petiole very short; fl. in ped. clusters, sometimes in short racemes; male sep. membranous, rounded, very concave; capsule ¼ in., glabrous, rough; seeds ⅛–⅙ in., testa with large shallow pits.

Low country, chiefly in the moist region, and rarely extending up to 4000 ft.; common. Fl. Dec.–April; pale yellow.

Also in S. India.

Very variable in foliage. Mueller makes 3 varieties—*ellipticum*, *lanceolatum*, and *spathulatum*—but (as observed in Fl. B. Ind.) they are not to be distinguished. C. P. 252 is Thwaites's var. β, with smaller flowers and much smaller leaves, often very narrow, and with spines along the edge. I do not find the l. pellucid-punctate, as stated in the generic characters given in Fl. B. Ind.

40. **CHÆTOCARPUS,** *Thw.*

Trees; l. entire, coriaceous; fl. small, diœcious, apetalous, in axillary clusters; male fl.:—sep. 4 or 5, imbricate; disk a row of glands or scales; stam. 8, fil. connate below in a column; pistillode a 3-fid. column; fem. fl.:—sep. of male; ov. 3-celled, with 1 ovule in each cell; style 3-partite; capsule nearly globose, woody, 3-valved, warted or prickly, valves leaving a woody axis; seeds subglobose, black, with a red caruncle, endosperm copious, cotyledons broad.—Sp. 8; 3 in *Fl. B. Ind.*

The genus is unknown in Peninsular India.

Capsule with rigid prickles.
  L. glabrous, under 4 in. . . . . . . 1. C. CASTANOCARPUS.
  L. hairy, over 4 in. . . . . 2. C. PUBESCENS.
Capsule with tubercles . . . . . . 3. C. CORIACEUS.

1. **C. castanocarpus,** *Thw. Enum.* 275 (1861). **Hédoka, Hédawaka,** *S.*

Herm. Mus. 25. Burm. Thes. 195. Fl. Zeyl. n. 434. *Edokke*, Gaertn. Fruct. ii. 486. Muell. Arg. in DC. l. c. 1122. *C. pungens*, Thw. in Kew Journ. Bot. vi. 301 (in part). C. P. 2641.

Fl. B. Ind. v. 460. Gaertn. Fruct. ii. t. 180, f. 7. Kew Journ. Bot. vi. t. 10, f. A, 2–5. Bedd. Fl. Sylv. t. 284.

A tree; twigs slender; young parts glabrous; l. 2½–4½ in., oval or ovate-oval, tapering to base, acuminate, acute, entire, glabrous, rather thick; petiole short; fl. on short ped., clusters globose; male fl.:—sep. 4, rounded, concave; disk a rim of small red glands; stam. 8, fil. united half way up in a column; capsule oblong-globose, ¾ in., valves woody, densely covered with acicular rigid prickles, bright red; seeds black.

Moist region below 2000 ft.; rather rare. Ambagamuwa and Ratnapura districts frequent; Hewesse, Pasdun Korale. Fl. Dec.-March.

E. Bengal, Burma, Andaman Is., Malay Peninsula.

Hermann's specimens are in young fruit, and Linnæus did not refer them to any genus.

Timber very hard. Leaves dry, dark brown.

2. **C. pubescens,** *Hk. f. in Fl. B. Ind.* v. 461 (1887).

C. castanocarpus, var. β, *pubescens*, Thw. Enum. 275. C. P. 3013.
Fl. B. Ind. v. 461.

A small tree; twigs and young parts hirsute-pubescent; l. large, 6–10 in., hairy-pubescent beneath, oblong-oval, shortly

acuminate, acute, thickly coriaceous; fl. numerous, crowded, as in *C. castanoçarpus*, but smaller; fr. as in last.

Moist region below 1000 ft.; very rare. Hewesse, Pasdun Korale. Fl. Dec.–April.

Endemic.

I think this scarcely more than a variety of *C. castanocarpus*, but Sir J. Hooker considers it 'entirely different,' relying on 'the much stouter and very hirsute branches and leaves beneath, the much larger very coriaceous leaves 8–10 by 3–4 in., and more minute sessile tomentose flowers, narrower sepals, and shorter tomentose staminal column.'

3. **C. coriaceus,** *Thw. Enum.* 275 (1861). **Hédoka, Hédawaka,** *S.*

C. pungens, Thw. in Kew Journ. Bot. vi. 301 (part). C. P. 1025.
Fl. B. Ind. v. 461. Kew Journ. Bot. vi. t. 10, f. A, 6–9.

A moderate-sized tree; young parts glabrous, or nearly so; l. 3–4 in., broadly oval or suborbicular, suddenly tapering below, shortly acuminate, subacute, or obtusely cuspidate, entire, quite glabrous, thickly coriaceous; petiole very short, stout, often corky; fl. in axillary clusters, male on short ped., fem. on longer ones; male fl.:—sep. glabrous; stam. 8, fil. connate only at base, pilose; capsule ovoid-globose, bluntly trigonous, nearly $\frac{3}{4}$ in., glabrous, glaucous green, covered with close bristle-pointed warts or tubercles; seeds black and shining, caruncle red.

Moist region, rather common, to 2000 ft. Ambagamuwa; Reigam Korale; Kukul Korale and Pasdun Korale; abundant; Galle. Fl. Dec.–March; pinkish.

Endemic.

41. SAPIUM, *P. Br.*

Trees, with acrid milky juice; l. alt., with conspicuous pinnate venation; fl. monœcious (or diœcious?), apetalous, in terminal or leaf-opposed spikes; male fl.:—calyx a minute membranous 2–3-toothed cup, not enclosing the stam. in bud; stam. 2 or 3, fil. distinct; pistillode 0; fem. fl.:—cal. 3-fid. or 3-partite; ov. 3-celled, with one ovule in each cell; styles 2–3, undivided; fr. a dry capsule, with woody cocci, and a central persistent column; seeds trigonous, estrophiolate, testa crustaceous, endosperm fleshy, cotyledon broad.—Sp. 40; 6 in *Fl. B. Ind.*

Evergreen, male and fem. fl. in same spikes . . . 1. S. INDICUM.
Deciduous leaved, male and fem. fl. on separate spikes . 2. S. INSIGNE.

1. **S. indicum,** *Willd. Sp. Pl.* iv. 572 (1805). **Kiri-makulu,** *S.*

Moon, Cat. 65. Thw. Enum. 269. C. P. 2946.
Fl. B. Ind. v. 471 (not given for Ceylon). Wight, Ic. t. 1950.

An evergreen glabrous tree 20–25 ft.; bark white, smooth; l. 3½–5 in., lanceolate, subacute at base, attenuate acute at apex, finely crenate-serrate, glabrous, shining above, venation translucent; petiole ½ in., bi-glandular at the top; spikes 2–3 in., leaf-opposed or subterminal; fl. sessile, male numerous, in clusters, fem. larger, usually 1 or 2 at base of the spike; sep. ciliate; styles 3, very long; capsule depressed-globose, not lobed, about 1 in. diam., glabrous, blackish-green, pericarp thin, cocci thick and hard, woody; seeds ½ in., grey.

Moist low country, chiefly near the coast; rare. Kalutara (Moon); Galle (Dr. Anthonisz). Fl. April; greenish yellow.

Sunderbuns of Bengal, Burma, S. India?

Milky juice poisonous. L. like those of a willow. The very woody fruit is characteristic.

2. **S. insigne,** *Trim. Syst. Cat. Ceyl. Pl.* 83 (1885). **Tel-kadura,** *S.* **Tilai,** *T.*

Falconeria insignis, Royle; Thw. Enum. 270. C. P. 654.

Fl. B. Ind. v. 471 (not given for Ceylon). Wight, Ic. t. 1866 (*Falconeria malabarica*). Bedd. Forest. Man. t. 22, f. 5 (*Excæcaria insignis*).

A moderate-sized deciduous-leaved tree; branchlets very thick, with smooth shining bark, marked with scars of l.; l. rather crowded at ends of branches, 6–9 in., oval or oblong-lanceolate, acute at base, acuminate, acute, crenate-serrate, often with a few glands on margin, glabrous, dark green above, paler beneath; petiole about 1 in., stout, with 2 conspicuous brown glands at summit; spikes 4–8 in., terminal, male and fem. separate, rachis very stout, glabrous; fl. sessile, male clustered; cal. 2 lipped; fem. solitary, with a pair of red glands at the base; sep. 3–5, ovate, acuminate; stam. 2; ov. glabrous, styles short, spreading; fr. (not seen) 'not woody, ⅓ in., ovoid or globose, obscurely lobed, 1–3 celled.'

Dry region; rather rare. Hambantota, abundant; Trincomalie; Nalande; Jaffna Dist. Tanukhai, N. Prov. (Brown). Fl. Jan., Feb.; green.

Trop. Himalaya, E. Bengal, Burma.

The stem exudes a white milky juice.

S. sebiferum, *Roxb.*, the Tallow-tree of China, is cultivated occasionally in the higher elevations, and shows a tendency to neutralise itself in the jungle near Hakgala Gardens and elsewhere.

42. EXCÆCARIA,* *Linn.*

Small glabrous trees, with acrid milky juice; l. alt. or opp.; fl. minute, spicate or racemose, monœcious or diœcious, apetalous, bracteate and bibracteolate, bracteoles with a broad gland; male fl. subsessile; sep. 3, connate in a minute cup,

* Name given by Rumph, because of its producing blindness (*excæcans*) in woodcutters if carelessly felling the tree.

not enveloping the stamens in bud; stam. 3, fil. distinct; pistillode 0; fem. fl. pedicelled; sep. 3, minute, broad; ov. 3-celled, with one ovule in each cell, styles 3, distinct, undivided, recurved; capsule of 3 crustaceous cocci falling away from a central column; seeds globose, estrophiolate, testa crustaceous, endosperm fleshy, cotyledons broad.—Sp. about 30; 9 in *Fl. B. Ind.*

1. **E. Agallocha,*** *L. Syst. Nat. ed.* 10, 1288 (1759). **Talakiriya,** *S.*

Willd. Sp. Pl. iv. 864. Moon, Cat. 68 and *E. Camettia*, Willd. Thw. Enum. 269. C. P. 2169.

Fl. B. Ind. v. 472. Hook. Comp. Bot. Mag. ii. t. 30. Wight, Ic. t. 1865 B.

A small tree; branchlets rather thick, marked with leaf-scars, smooth; l. $2\frac{1}{2}$–$3\frac{1}{2}$ in., alt., oval, acute at base, shortly obtusely acuminate, obtuse, entire or obscurely crenate, rather thick, veins, except midrib, very inconspicuous; petiole $\frac{3}{4}$–1 in., slender; male spikes numerous, catkin-like, supra-axillary, crowded, $1\frac{1}{2}$–2 in.; male fl. sessile in the rounded, acuminate bracts; fem. spikes fewer, more slender, pedicelled; male fl.:—sep. minute, unequal, subserrulate; fil. elongate; capsule $\frac{1}{4}$–$\frac{1}{2}$ in., very variable in size.

On the coast, by tidal estuaries and backwaters; common. Fl. Feb.–Sept.; yellow.

Throughout the shores of Tropical Asia to Australia.

Flowers fragrant, fresh sap extremely acrid, hence called the Blinding tree in India. *E. Camettia*, Willd., is a form with larger fruit; Moon gives Trincomalie for this.

2. **E. crenulata,** *Wight, Ic.* v. 2, 20 (1852).

E. oppositifolia, Thw. Enum. 269 (non Jack). *E. cochinchinensis*, Muell. Arg. in DC. Prod. xv., ii., 1215. C. P. 2523.

Fl. B. Ind. v. 473. Wight, Ic. t. 1865. Bedd. For. Man. t. xxii. f. v.

A small tree; branchlets slender, marked with scars of l. and stip.; l. opp., narrowly oblong-lanceolate, acute at both ends, tip obtuse, shallowly crenate-serrate, thin; petiole about $\frac{1}{2}$ in.; stip. ovate, acuminate, deciduous; spikes or racemes slender, axillary, or apparently terminal; male fl.:—bracteoles and lanceolate sepals erose; fem. fl. few, often at base of male spike; capsule 1 in. diam., smooth, green.

Forests of montane zone, 4000–6000 ft.; rather common. Also on Ritigalu at about 2000 ft. Fl. Feb.; greenish.

Also in S. India.

Has much the appearance of a *Chloranthus*.

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* Name given by Linnæus, probably from the tree resembling the Aloe tree (*Aquilaria agallocha*) of Rumph.

43. **SEBASTIANIA,** *Spreng.*

An annual herb; l. alt., distant; fl. monœcious, apetalous, male very minute in short axillary or leaf-opposed spikes, fem. solitary at the base of the male or axillary; male fl.:—cal. minute, 5-lobed, membranous, not covering the stam. in bud; stam. 1–4, fil. distinct; pistillode 0; fem. fl.:—sep. 3, larger than in male, obovate, acute, lacerate and ciliate, 2-glandular within; ov. much exserted, 3-celled, with 1 ovule in each cell, styles 3, small, not bifid; fr. a small glabrous 3-lobed capsule, subglobosely oblong, valves with a double row of small spines on the back, separating from a persistent columella; seeds barrel-shaped, with a short strophiole, endosperm fleshy, cotyledons broad.—Sp. 40; all American but the following.

S. Chamælea, *Muell. Arg. in DC. Prod.* xv. ii. 1175 (1866). **Rat-piṭawakka,** *S.*

Herm. Mus. 22, 33. Burm. Thes. 59. Fl. Zeyl. n. 335. *Tragia Chamæiea*, L. Sp. Pl. 981. Moon, Cat. 62. *Microstachys Chamælea*, A. Juss.; Thw. Enum. 270. C. P. 2132.
Fl. B. Ind. v. 475. Burm. Thes. t. 25.

An annual glabrous herb, 1–2 ft., with numerous prostrate or ascending slender branches from the root; l. small, distant, ½–3 in., nearly sessile, linear, acute at base, obtuse, apiculate, very minutely serrate, glabrous, often rather glaucous beneath; stip. ovate, acute, ciliate; fr. under ¼ in., glabrous, smooth except for the rows of spines.

Open places and waste ground; common. Fl. Oct.; yellowish.
Tropics of the old world generally.
Habit of an annual *Euphorbia*.

CXXI.—URTICACEÆ.

HERBS, shrubs, or trees, some with milky juice; l. rarely opposite, often oblique at the base, rarely compound, stipulate; infl. various, sometimes immersed or on the surface of a fleshy disk, or, in *Ficus*, enclosed in a fleshy receptacle; fl. unisexual, rarely polygamous, small; sep. distinct or forming a lobed or toothed cal.; stam. as many as and opposite the perianth divisions, or fewer, fil. erect or incurved in bud; pistillode of male small, or 0; ov. superior, 1-celled, with one

ovule in each cell, style simple or 2-fid, elongate, or stigma sessile, plumose or penicillate; fr. a simple indehiscent samara or drupe, or a small achene, or a fleshy syncarpium of confluent pericarps and perianths with immersed achenes; seed erect or pendulous, endosperm copious, scanty, or o.

Ovule pendulous from near the top of the ov., anatropous.
  Stams. erect in bud, or nearly so.
    Fr. a winged samara; a tree (*Ulmeæ*) . . 1. HOLOPTELEA.
    Fr. a drupe; trees or shrubs (*Celtideæ*).
      Stip. free.
        Male sep. imbricate . . . . 2. CELTIS.
        Male sep. valvate . . . . . 3. TREMA.
      Stip. connate, convolute . . . . 4. GIRONNIERA.
    Fr. of crustaceous achenes enclosed in a fleshy receptacle or confluent with the sep. in a fleshy syncarpium; trees or shrubs (*Artocarpeæ*).
      Male and fem. fl. in closed receptacles . 5. FICUS.
      Male fls. in open disk-like receptacles . 6. ANTIARIS.
      Male fls. in globose or cylindric heads or spikes.
        Male fl. tetrandrous . . . . 7. CUDRANIA.
        Male fl. monandrous . . . . 8. ARTOCARPUS.
  Stams. inflexed in bud; trees or shrubs.
    Style deeply bifid, or styles 2 (except *Dorstenia*).
      Male fl. capitate, spicate, or racemed.
        Male fl. racemed; bracts minute . . 9. TAXOTROPHIS.
        Male fl. subcapitate.
          Bracts and fem. seps. large, accrescent 10. PHYLLOCHLAMYS.
          Bracts small; fem. seps. small . . 11. STREBLUS.
      Male and fem. fl. crowded on a flat receptacle 12. DORSTENIA.
    Style undivided (or with a short arm in 13).
      Male fl. spicate, fem. distinct . . . 13. ALLAEANTHUS.
      Male fl. capitate, fem. confluent . . . 14. PLECOSPERMUM.
Ovule erect from or near the base of the ov., orthotropous. Stams. inflexed in bud.
  Herbs or shrubs with stinging hairs (*Urereæ*).
    An annual herb . . . . 15. FLEURYA.
    Perennial herbs or shrubs.
      Fem. perianth 3–4-partite . . . 16. LAPORTEA.
      Fem. perianth 2–3-toothed . . . 17. GIRARDINIA.
  Herbs, shrubs, or trees with no stinging hairs.
    Male and fem. perianth 3–5-partite (*Procrideae*).
      L. opposite.
        Fl. in cymes or heads . . . . 18. PILEA.
        Fl. on a disciform recept. . . . 19. LECANTHUS.
      L. alternate.
        Male and fem. fl. in cymes . . . 20. PELLIONIA.
        Male and fem. fl. on a fleshy recept. . 21. ELATOSTEMMA.
        Male fl. in cymes, fem. on a disciform recept. . . . . . . 22. PROCRIS.

Male perianth 2–5-cleft, fem. tubular or 0 (*Boehmerieæ*).
Fruiting perianth dry.
Shrubs or trees, style filiform . . 23. BOEHMERIA.
Herbs.
Stigma ovate, persistent . . . 24. CHAMABAINIA.
Stigma filiform, deciduous . . 25. POUZOLZIA.
Fruiting perianth fleshy.
Fem. fls. surrounded by fleshy bracteoles 26. VILLEBRUNIA.
Fem. fl. naked . . . . . . 27. DEBREGEASIA.

A very large, chiefly tropical family, to which belongs the common nettle. The stems of many yield a valuable fibre, especially the Pacific Island *Broussonetia*, from the inner bark of which tappa cloth is made.

Ceylon, though containing more than half (27) of the number of genera of *Urticaceæ* occurring in British India (45), is poor comparatively in species. Of these there are nearly 300 in British India, but only about 68 in Ceylon.

1. **HOLOPTELEA,** *Planch.*

A deciduous tree; l. alt., pennivcined; stip. scarious; fl. polygamous; sep. 4–8, imbricate; stam. 4–8 or more, fil. erect in bud, anth. pubescent; ov. stipitate, compressed; stigmas 2, subulate; ovule pendulous, anatropous; fr. a dry, winged samara; seed flat, endosperm 0, cotyledons very broad, complicate.—Monotypic.

H. integrifolia, *Planch. in Ann. Sc. Nat. ser.* 3, x. 266 (1848).
Goda-kirilla, *S.* **Ayil, Velayil, Kaûchiá,** *T.*
Ulmus integrifolia, Roxb.; Moon, Cat. 21; Thw. Enum. 267. C. P. 2381. Fl. B. Ind. v. 481. Wight, Ic. t. 1968. Bedd. Fl. Sylv. t. 310.

A tree 50–60 ft. high, with ash-grey pustular bark; shoots glabrous; l. 2–5 in., oval to obovate-oblong, cuspidately acuminate or apiculate, entire (young serrate), glabrous, base rounded or cordate, veins 5–7 pairs, glabrous, or with the petiole $\frac{1}{4}$–$\frac{1}{3}$ in. puberulous; fl. of both sexes usually mixed in short racemes or fascicles at the scars of fallen leaves, about $\frac{1}{6}$ in. diam.; sep. usually 4, pubescent, deciduous; fil. glabrous, anth. pubescent; samara orbicular, in puberulous racemes, $\frac{2}{3}$–1 in. broad, notched at the top with 2 usually incurved teeth, ped. $\frac{1}{4}$–$\frac{1}{2}$ in., very slender, jointed in the middle, nucleus in the centre of the samara, broadly oval, flat, reticulate, wings beautifully veined.

Dry region; common. Fl. July; greenish.
India, Burma, Cochin China.
Planchon distinguishes the Ceylon tree as var. *zeylanica;* but on no valid characters.
This is the Indian elm. Wood strong, heavy, pale, very useful for many purposes.

2. **CELTIS,** *Linn.*

Evergreen trees; l. bifarious, base 3-veined; stip. free; fl. polygamous, cymose, green, fem. in upper axils, male and bisexual usually in lower; sep. 5, imbricate; stam. 4–5, fil. erect in bud, anth. small; disk villous; ov. sessile, stigmas 2, slender or flattened, deciduous; ovule pendulous; fr. an ovoid or globose drupe; seed ovoid, endosperm scanty or 0, cotyledons surrounding the upcurved radicle.—Sp. 80; 4 in *Fl. B. Ind.*

L. obliquely ovate . . . . 1. C. CINNAMOMEA.
L. nearly straight, oblong or ovate-oblong . . 2. C. WIGHTII.

1. **C. cinnamomea,** *Lindl. in Wall. Cat.* 3693 (1828). **Gurénda,** *S.* [PLATE LXXXVI.]
C. dysodoxylon, Thw. Enum. 267. Planch. in DC. Prod. xvii. 181. *C. orientalis*, Moon, Cat. 73. C. P. 2563.
Fl. B. Ind. v. 482.

A tree, 30–40 ft.; branchlets tomentose; l. 3–4 in., obliquely ovate, long-acuminate, entire crenate or serrate, glabrous, coriaceous, dark green, 3-veined to below the tip, penniveined and reticulate with transverse venules, base acute or rounded; petiole $\frac{1}{4}$–$\frac{1}{3}$ in.; male fl. in short puberulous racemose cymes with slender branches; fem. and bisexual, in more slender axillary or terminal cymes; stam. 5; stigmas linear; drupe pisiform, narrowed to the obtusely beaked tip.

Moist region, 2–5000 ft.; rather common. Fl. Feb., March; greenish. E. Bengal, Burma, Malay Archipelago.

The name *cinnamomea* refers to the character of the leaves; Thwaites' name, *dysodoxylon*, to the very disgusting smell of the fresh wood, especially when wet, of which the Singhalese name is descriptive. Thunberg (*Travels*, iv. 234) says it was called 'Strunt-hout' by the Dutch, and employed as an alterative medicine internally and externally in skin affections. The wood in chips is sold in the bazaars as a medicine, under the name 'Pinari,' and is exported to Bombay, where it is employed as a fumigatory against evil spirits.

2. **C. Wightii,** *Planch. in Ann. Sc. Nat. ser.* 3, x. 307 (1848). **Meditella,** *S.*
Thw. Enum. 267. Planch. in DC. Prod. xvii. 184. C. P. 50.
Fl. B. Ind. v. 483. Wight, Ic. t. 1969.

A tree, 30–40 ft.; young shoots puberulous; l. 4–7 in., oblong or oblong-oval or lanceolate, acuminate or caudate, entire or young, remotely toothed crenate or serrate, or coarsely toothed above the middle, glabrous or puberulous beneath, coriaceous, 3-veined to the tip, penniveined and reticulate with transverse venules, yellow-green, base rounded

or acute; petiole $\frac{1}{4}$–$\frac{1}{3}$ in.; stip. peltate; cymes short, puberulous; sep. acuminate, ciliate; drupe shortly pedicelled, oval or ovoid, $\frac{1}{4}$–$\frac{1}{2}$ in., scarlet, tip obtuse or bifid, endocarp rugose.

Low country to 3000 ft., chiefly in the intermediate zone; rather common. Lunugala, Uva; Galagama; Hangaranketa; Kurunegala; Peradeniya. Fl. Feb.; yellow. Fr. scarlet. Young foliage pink, like that of cinnamon, to which the venation is also similar.

S. India, Andaman Is., Malay Is., Australia.

3. **TREMA,** *Lour.*

Unarmed evergreen trees or shrubs; l. alt., distichous, serrate, 3-nerved; stip. lateral, caducous; fl. in small axillary cymose clusters, monœcious or polygamous, 3-bracteolate; sep. 4–5, induplicate-valvate, or subimbricate, concave, much smaller and flat in fem.; stam. 4–5, fil. erect in bud; ov. sessile; styles short, subulate, incurved, ovule pendulous; drupe ovoid, endocarp hard, endosperm fleshy, embryo curved, cotyledons narrow, radicle slender.—Sp. 20–30; 6 in *Fl. B. Ind.*

T. orientalis, *Bl. Mus. Bot.* ii. 62 (1852). **Gédumba,** *S.*

Herm. Mus. 14. Burm. Thes. 26. Fl. Zeyl. n. 369. *Celtis orientalis*, L. Sp. Pl. 1044; Moon, Cat. 73. *Sponia orientalis*, Planch.; Thw. Enum. 267; Planch. in DC. l. c. 200. C. P. 2203.

Fl. B. Ind. v. 484. Wight, Ic. t. 1971 (*S. Wightii*). Bedd. Fl. Sylv. t. 311.

A fast-growing tree, 25–30 ft.; branchlets pubescent; l. 3–5 in., obliquely ovate to oblong-lanceolate, acuminate, crenate-serrulate, chartaceous, base cordate or rounded on one side, scabrid above, clothed beneath with silvery appressed hairs, midrib and outer sides of lateral veins penniveined; petiole $\frac{1}{6}$–$\frac{1}{4}$ in.; stip. caducous; cymes pubescent; male fl. globose, 3-bracteolate, sep. acuminate, pubescent; fem. sep. minute; ov. short, broad; drupe $\frac{1}{6}$ in., black.

Open places and waste ground up to 5000 ft.; very common. Fl. Feb.; greenish.

India and Malaya.

This may well be called a weed, though forming a small tree. It is known as the 'Charcoal-tree' by the English.

4. **GIRONNIERA,** *Gaud.*

Unarmed evergreen trees or shrubs; l. alt., penniveined; stip. sheathing the buds, caducous; fl. diœcious, in short axillary cymes, or the fem. solitary; male fl.:—minute, globose; sep. 5, broad, obtuse, imbricate; stam. 5; fil. suberect in bud; pistillode woolly; fem. fl.:—seps. narrower than in the male fl., acute; ov. sessile, style central, stigmas 2,

filiform, spreading; ovule pendulous; drupe ovoid or globose, endocarp hard, endosperm present or 0, embryo contorted or convolute.—Sp. 8 or 10; 5 in *Fl. B. Ind.*

Drupe pubescent . . . . 1. G. SUBÆQUALIS.
Drupe glabrous . . . . 2. G. RETICULATA.

G. subæqualis, *Planch. in Ann. Sc. Nat. ser.* 3, x. 339 (1848), var. **zeylanica,** *Thw. Enum.* 268. **Ak-médiya,** *S.*
Helminthospermum scabridum, Thw. in Kew Journ. Bot. vi. 302. *G. parvifolia*, Planch. in DC. l. c. 206. C. P. 716.
Fl. B. Ind. v. 485. Kew Journ. Bot. vi. t. 9, C. Bedd. Fl. Sylv. t. 313, f. 2.

A medium-sized tree; branchlets scaberulous; l. alt., 2–6 in., oval-lanceolate or oblanceolate, acuminate or caudate, base cuneate, serrulate towards the tip, above smooth and shining, scaberulous beneath, veins 8–10 pairs, strong and strigose beneath; stip. $\frac{1}{2}$ in., silky; male fl.:—sep. rounded; anth. ovate; fem. fl.:—subsolitary, ped. $\frac{1}{6}$–$\frac{1}{4}$ in., pubescent; sep. 4; ov. sessile, hirsute; drupe $\frac{1}{2}$ in., ovoid, strigose, fleshy, endocarp bony, endosperm 0, embryo vermiform, convolute.

Moist region up to 4000 ft.; rather common. Pasdun Korale; Ambagamuwa; Kotmalie; Hewaheta; Hanasgiriya. Fl. Jan.
Endemic (this variety); the type in Andaman Is., Malaya and China.

2. **G. reticulata,** *Thw. Enum.* 268 (1861). **Wal-munamal,** *S.*
Aphananthe cuspidata, Planch. in DC. l. c. 209. C. P. 3565.
Fl. B. Ind. v. 486. Bedd. Fl. Sylv. t. 313, f. 1.

A tree, 30–40 ft.; branchlets glabrous, lenticellate; young parts glabrous or sparsely appressedly hairy; l. 3–5 in., oblong- to ovate-lanceolate, acuminate or caudate, base rounded or acute, smooth, glabrous, shining, and finely reticulate above, scaberulous beneath, veins 10–12 pairs, spreading; petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; stip. connate, lanceolate, hairy, caducous; male cymes shortly peduncled; fem. fl. solitary, axillary; ov. glabrous; drupe $\frac{1}{2}$–$\frac{3}{4}$ in., ovoid, hardly compressed, stoutly beaked, glabrous.

Low country, 1–3000 ft.; rather rare. Between Kurunegala and Matale common (Alexander); Gangaruwa; Deltota; Peradeniya; Badulla Dist. Fl. Feb., March.
S. India, E. Bengal, Burma, Java.
Leaves dark red-brown when dry. Timber hard, heavy, useful for engineering purposes.

5. FICUS, *Linn.*

Trees or shrubs, sometimes epiphytic and scandent, juice milky; leaves alt. rarely opp., rarely lobed, serrate or toothed, 3–5-veined at the base, penniveined above; stip. various; fl. minute, unisexual, of 3 kinds, male, fem., and imperfect fem.

(gall fl.), crowded along with bracteoles on the inner walls of a fleshy receptacle, the base of which is usually 3-bracteate, and the mouth closed by imbricating bracts; male fl.:—perianth 2–6-fid or partite; stam. 1 or 2, fil. erect; fem. fl.:—perianth of male or 0; ov. straight or oblique, style excentric, stigma simple or 2-fid, ovule pendulous; achenes minute, crustaceous, endosperm scanty, embryo curved.—Sp. about 60 ; 112 in *Fl. B. Ind.*

In the Ceylon *Fici* the receptacles are androygnous, with the male fl. nearest the mouth. The gall fl. are fem., but perfect no seed, the ov. being occupied by the pupa of a hymenopterous insect; they often occupy with the male fl. one receptacle, the fem. another.

The descriptions of the species here given closely follow those of Dr. King in the *Annals of the Royal Bot. Gardens of Calcutta*, and the species follow in the sequence adopted in that work, which is their natural classification. As, however, this classification is derived from characters difficult to detect in Herbarium specimens, I have given an artificial key to the species, and followed it by the definition of the natural groups, according to which they are arranged.—J. D. H.

ARTIFICIAL GROUPING OF THE CEYLON *FICI*.

Tall trees.
Veins of leaf more or less distant.
Basal pair of veins very distinct from the others.
Recepts. sessile.
L. glabrous . . . . 2. F. BENGHALENSIS.
L. hoary beneath . . . . . . 4. F. TOMENTOSA.
Recepts. peduncled (short in *Arnottiana*).
L. broadly ovate-cordate, glabrous . 10. F. ARNOTTIANA.
L. oblong, scabrid . . . . . . 17. F. ASPERRIMA.
Basal pair of veins slender, short, not very distinct from the others.
Recepts. sessile or subsessile.
Recepts. oblong . . . . . . 3. F. MYSORENSIS.
Recepts. globose or subglobose.
Basal bracts large connate below . 5. F. ALTISSIMA.
Basal bracts free.
Recepts. clustered . . . . . 12. F. TSIAKELA.
Recepts. in pairs.
L. coriaceous . . . . 13. F. TSIELA.
L. membraneous . . . . . 14. F. INFECTORIA.
Recepts. peduncled.
Lateral veins 5–7 pairs . . . . . 9. F. NERVOSA.
Lateral veins 9–15 pairs.
Recepts. 1 in. diam. . . . . . 15. F. CALLOSA.
Recepts. $\frac{1}{3}$–$\frac{1}{2}$ in. diam. . . . . 11 F. MOONIANA.
Veins of leaf very many and close-set.
Recepts. sessile.
Recepts. $\frac{1}{3}$–$\frac{3}{4}$ in. . . . . . . 6. F. TRIMENI.
Recepts. $\frac{1}{4}$–$\frac{1}{3}$ in. . . . . . . 8. F. RETUSA.
Recepts. peduncled . . . . . . 7. F. CAUDICULATA.

Shrubs or epiphytes, rarely arboreous; recepts. peduncled in all.
Recepts. on special arrested branches.
L. glabrous . . . . 21. F. GLOMERATA.
L. hispid . . . . 18. F. HISPIDA.
Recepts. axillary, or on the scars of ordinary branchlets.
L. scabrid . . . . 16 F. HETEROPHYLLA.
L. smooth or nearly so.
L. broadly ovate, caudate . . . . . 20. F. LÆVIS.
L. oblong or obovate.
Recepts. warted . . . . . . 1. F. PARASITICA.
Recepts. smooth . . . . . . 19. F. THWAITESII.

NATURAL SECTIONS TO WHICH THE CEYLON *FICI* BELONG.

* Fl. monandrous (diandrous in 15. *F. callosa*).

1. PALAEOMORPHE. Small tree or erect shrub; recepts. fascicled in the l. axils or at the scars of fallen l.; basal bracts 0:—1. *F. parasitica.*
2. UROSTIGMA. Tall trees or powerful climbers; recepts. solitary or binate in the l. axils, or at the scars of fallen l.; basal bracts 3, large, 0 in 9. *F. nervosa.*

† Petiole short (½–1½ in.), not jointed on the blade.

L. with more or less distant veins:—2. *F. benghalensis*, 3. *F. mysorensis;* 4. *F. tomentosa;* 5. *F. altissima;* 9. *F. nervosa;* 15. *F. callosa.*

L. with very close-set veins:—6. *F. Trimeni;* 7. *F. caudiculata;* 8. F. *retusa.*

†† Petiole long (1–6 in.), often obscurely jointed on the blade:—10. *F. Arnottiana;* 11. *F. Mooniana;* 12. *F. Tjakela;* 13. *F. Tsiela;* 14. *F. infectoria.*

3. SYCIDIUM. Small trees, shrubs, or climbers; recepts. small, solitary, or binate in the l. axils or at the scars of fallen l.; basal bracts minute or 0:—16. *F. heterophylla;* 17. *F. asperrima.*
4. COVELLIA. Shrubs or trees, never climbers; recepts. clustered on special arrested branches near the base of the trunk, or on cauline or rameal tubercles; basal bracts 3:—18. *F. hispida.*

** Fl. di-tri-androus.

5. EUSYCE. Erect or scandent shrubs or trees; recepts. subsolitary, axillary, small; basal bracts 3:—19. *F. Thwaitesii;* 20. *F. lævis.*
6. NEOMORPHE. Trees; recepts. on short arrested branches, or on cauline or rameal tubercles; basal bracts 3:—21. *F. glomerata.*

1. **F. parasitica,** *Koen. ex Willd. in Mem. Acad. Berol.* 1798, 102 (1801). **Gas-nétul, Wel-éhétu.** *S.*

Thw. Enum. 266. *F. gibbosa*, Bl., var. *tuberculata*, King, Fic. 6. C. P. 2227.

Fl. B. Ind. v. 496 (*F. gibbosa*). Wight, Ic. t. 651 (*F. tuberculata*). King, Fic. tt. 2 A, 2 B.

An epiphyte in a young state, finally a tree with spreading branches; l. oblong or oval to lanceolate, obtuse acute or subcaudate, smooth or scaberulous on both surfaces, base acute, veins 3-7 pairs, spreading, prominent, basal pair conspicuous; stip. lanceolate, about as long as the short petiole; recepts. axillary, solitary or binate, peduncled, pyriform, ½ in.

diam., verruculose, umbilicus prominent, open; basal bracts 0; ped. $\frac{1}{10}$–$\frac{1}{3}$ in., pubescent, with a few minute bracteoles; male fl. close to the mouth of the gall-bearing recepts.; sep. of gall-fl. linear, fleshy, hairy; ov. globose; fert. fem. fl. in separate recepts.; sep. linear, hairy, style long.

Low country to 3000 ft.; very common. Fl. April. Fr. yellow.

India, Burma, Andaman Is., Malaya, S. China.

This is always, at first at all events, parasitic in Ceylon, but is described as a tree by Klng. It is very variable in the foliage. *F. parasitica* is very much the oldest name. *F. gibbosa* is a larger-leaved variety confined to Malaya. The specimens in Herb. Perad. are very poor, and it is not stated whether they are from an old or young state of the plant. The leaves are nearly smooth on both surfaces, as in King's *F. gibbosa*, var. *cuspidifera* (Ann. p. 6), for which Ceylon is given as a habitat.

2.* **F. benghalensis,** *L. Sp. Pl.* 1059 (1753). **Maha-nuga,** *S.* **Al,** *T.*

Moon, Cat. 74. *Urostigma benghalense*, Gasp., Thw. Enum. 265. C. P. 2225.

Fl. B. Ind. v. 499. Wight, Ic. t. 1989 (*U. benghalense*). King, Fic. tt. 13, 81, f. C.

A very large evergreen tree, 70–100 ft., with huge spreading limbs that emit aerial roots, the latter forming accessory trunks, extending the area occupied by the tree indefinitely; branchlets stout, softly pubescent; l. 4–8 by 2–5 in., oval, ovate or orbicular-ovate to oblong, coriaceous, obtuse or obtusely cuspidate, quite entire, glabrous or puberulous beneath, base rounded subcordate or acute, basal veins strong, lateral 7–8 pairs, finely reticulate beneath; petiole $\frac{1}{2}$–2 in.; stip. $\frac{3}{4}$–1 in., coriaceous; recepts. in axillary pairs, sessile, globose, about $\frac{3}{4}$ in. diam., puberulous; basal bracts 3, orbicular, spreading; male fl. near the mouth of the recepts., monandrous; sep. of male and gall fl. 4, broad; fert. fem. fl. sep. shorter, style longer.

Low country to 2000 ft., especially in the dry region, but always, I think, planted. Fl. December. Fr. dark red.

The well-known 'Banyan' of Europeans, in which the tendency to form aerial roots from the branches which become additional stems is carried to its greatest extent.

There are several fine specimens in Ceylon, as at Jaffna, Negombo, &c., and in Hook. Journ. Bot. iii. (1841) at t. 13 is a drawing by Major Forbes of a tree near Matale; but it does not seem to be indigenous. It is said to be native in the sub-Himalayan forests and the lower slopes of the hills of S. India.

3. **F. mysorensis,** *Heyne in Roth, Nov. Sp.* 390 (1821). **Bu-nuga,** *S.*

F. cotoneæfolia, Vahl. Moon, Cat. 74. *Urostigma mysorense*, Thw. Enum. 265. King, Fic. 19. C. P. 2222.

Fl. B. Ind. v. 500. King, Fic. tt. 14, 81, f. A.

A large umbrageous evergreen tree, with a few aerial roots embracing the trunk; branchlets and leaves at first flocculent with a rusty-grey tomentum, at length glabrous; l. 4–8 in., oval-ovate ovate-oblong or obovate, obtuse or cuspidate, entire, base acute rounded or cordate, veins 8–15 pairs, prominent beneath, spreading and slightly arching, basal pair inconspicuous; petiole ¾–1¼ in., stout; stip. broadly triangular; recepts. binate, sessile, oblong or subobovoid, top truncate or depressed, young flocculent, enclosed in a calyptriform involucre, ripe glabrous; basal bracts 3, triangular, obtuse, spreading; male fl. pedicelled; sep. 4; stam. 1, anth. didymous; achene of gall-fl. broad, style short; achene of fem. fl. ovoid, style lateral, elongate.

Low country to 2000 ft., chiefly in the dry region; rather rare. Kurunegala; Nalande; Anuradhapura; Ekiriankumbura, Uva. Fl. June. Fr. orange-red.

Also in India and Burma.—Vahl's name would seem to have priority over Heyne's, but I follow King in the nomenclature given.

There are two drawings named *F. mysorensis* in Herb. Perad.; one (C. P. 2222) has green, globose, speckled figs; the other, from a tree at the entrance of the Bot. Gardens, has oblong figs, 1–1¼ in. long by 1 in. diam.

4. **F. tomentosa,** *Roxb. Hort. Beng.* 103 (1814). **Wel-aralu,** *S.*
Urostigma tomentosum, Miq., Thw. Enum. 265. C. P. 2226.
Fl. B. Ind. v. 501. Wight, Ic. t. 647. King, Fic. tt. 18, 81, f. G.

A large umbrageous tree; branches emitting small aerial roots; young parts clothed with rusty-grey tomentum; l. crowded on the ends of the branches, 2–4 in., oval-ovate or obovate-oblong, obtusely apiculate, entire, coriaceous, glabrous, at length shining and dotted above, hoary beneath, base rounded or subcordate, veins 5–7 pairs, basal pair strong; petiole ½–1 in.; stip. ⅓–½ in., densely woolly; recepts. axillary, binate, sessile, globose, ¼–½ in. diam., tomentose; basal bracts 3, large, spreading; male fl.:—sep. 4, lanceolate; stam. 1; gall and fem. fert. fl.:—sep. 4, shorter than the ov.; ov. of gall fl. smooth, style short; achene tubercled, style long.

Rocky places and old buildings in the dry region; rather rare. Nilgala; Mihintale; Polonaruwa; Bintenne; Trincomalie. Fl. July–September; Fr. grey, *Roxb.*

Also in India.

Abundant in the ruins of Polonawura, which it has done much to destroy. Specimens in Herb. Perad. have l. ovate to orbicular, quite glabrous above, finely puberulous beneath.

5. **F. altissima,** *Bl. Bijdr.* 444 (1825), var. **Fergusoni,** *King, Fic.* 31 (1887). **Nuga, Kosgona,** *S.*
Urostigma lacciferum, Miq., Thw. Enum. 265. C. P. 2221.
Fl. B. Ind. v. 504. King, Fic. t. 31, f. C.

A large tree, 80–100 ft. high, with few aerial roots, quite glabrous, except the pubescent shoots; branchlets very stout; l. 4–7 in., ovate oval-oblong or lanceolate, obtusely cuspidate, quite entire, base cuneate, coriaceous, veins slender, 10–12 pairs, basal pair short; petiole stout, $\frac{3}{4}$–$1\frac{1}{2}$ in.; stip. 1–$1\frac{3}{4}$ in., lanceolate, very coriaceous; recepts. axillary, sessile, solitary and binate, subglobose, $\frac{1}{2}$–$\frac{3}{4}$ in. diam., smooth, young enclosed in calyptriform bracts; basal bracts 3, rounded, hoary, connate below; male fl. scattered over the walls of the recept., pedicelled, sep. 4, stam. 1, anth. subsessile; fem. fl.;—perianth deeply 4-cleft; ov. of gall fl. smooth, of fert. fem. usually tubercled.

Moist low country to 3000 ft.; common. Fl. Aug.–November. Fr. orange-red, as large as a cherry.

This var. endemic; the type and other vars. in India, Burma, Andaman Is., Malaya.

I am not clear as to whether the type occurs wild in Ceylon, though it is given in Fl. B. Ind. There are trees in the Botanic Gardens, and I think I have seen it by the Mahaweli below Kandy. Dr. King erroneously spells W. Ferguson's name with double s, after whom he names this tree.

6. **F. Trimeni,** *King in Journ. Bot.* xxiii. 242 (1885).
Urostigma Tjiela, Thw. Enum. 265 (in part) (non Miq.). King, Fic. 46. C. P. 2220.
Fl. B. Ind. v. 509. King, Fic. tt. 55, 83, f. 1.

A gigantic glabrous tree; branches widely spreading, with few aerial roots; l. 3–$4\frac{1}{2}$ in., oblong oval or ovate-oval, obtuse, coriaceous, base cuneate, veins very many pairs, close-set, slender, widely spreading and anastomosing; petiole $\frac{3}{4}$ in.; stip. about $\frac{1}{2}$ in., ovate, acuminate; recepts. solitary or binate, axillary, sessile, globose, $\frac{1}{2}$–$\frac{3}{4}$ in. diam., smooth, mouth minute; basal bracts small, ovate-cordate; male fl. scattered, pedicelled; sep. 3, broadly ovate; stam. 1, anth. sessile; sep. of pedicelled gall fl. and fert. fem. fl. 5, lanceolate; style of achene elongate, stigma flattened.

Low country to 2000 ft.; rather rare. Peradeniya; Kaduganawa; Ekiriankumbura, Uva. Fl. April–May, July–Aug. Fr. orange-yellow or red when ripe, not dotted.

Also in Western Peninsular India.

A magnificent specimen of this species, with the branches covering a circle of about 200 ft. in diameter, is a well-known feature of the Peradeniya Gardens. It grew at first epiphytically on a Jack-tree, which it destroyed and supplanted.

7. **F. caudiculata,** *Trim. in Journ. Bot.* xxiii. 243 (1885). King, Fic. 48.
Fl. B. Ind. v. 510. King, Fic. t. 58 A.

A large tree, quite glabrous, l. $2\frac{1}{2}$–$3\frac{1}{2}$ in., narrowly oval,

cuspidate or abruptly caudate, thickly membranous, minutely reticulate beneath, base broad rounded on subtruncate, veins many pairs, very slender, basal inconspicuous; petiole $\frac{1}{3}$–$\frac{2}{3}$ in., rather stout; stip. 1 in., ovate, acuminate, membranous, subpersistent; recepts. solitary or binate, axillary, shortly peduncled, globose, $\frac{1}{2}$ in. diam., smooth; basal bracts 3, broad, acute, connate in a shallow cup; male fl. few, scattered; sep. 3, lanceolate; stam. 1, fil. short, broad, anth. ovate, apiculate; gall and fert. fem. fl. sessile or pedicelled, sep. 4–5, linear; ov. ovoid, style elongate.

Moist region below 1000 ft.; very rare. Only found at Paregoda, Pasdun Korale. Fl. June. Fr. red.

Endemic.

8. **F. retusa,** *L. Mant.* 129 (1767). **Panu-nuga,** *S.* **Itti,** *T.*

F. nitida, Thunb. and *F. Benjamina*, Willd. (non L.), Moon, Cat. 74. *Urostigma retusum*, Miq., Thw. Enum. 265. C. P. 14, 2537.

Fl. B. Ind. v. 511 (not given for Ceylon). Wight, Ic. t. 642. King, Fic. tt. 61, 62, 84, f. P.

A large umbrageous, evergreen, quite glabrous tree, with a few aerial roots; l. shortly petioled, 2–5 in., oval broadly ovate-obovate or rhomboid, obtuse or obtusely cuspidate, reticulate beneath, base narrowed into the petiole, veins very many pairs, slender, erecto-patent, anastomosing, basal pair rather conspicuous; petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; stip. lanceolate; recepts. small, sessile, axillary, binate; basal bracts broadly ovate, obtuse, spreading, persistent; male fl. scattered; sep. 3, subspathulate; stam. 1, anth. cordate, apiculate; gall and fert. fem. fl. sessile or pedicelled; sep. 3, oblong or broadly spathulate, largest in the gall fl., ov. smooth; achene ovoid or obovoid, style slender, stigma elongate.

Moist and dry regions, in the former extending into the montane region up to 6000 ft.; common. Fl. August, Sept., also Jan., April. Fr. pale yellow or reddish.

India, Burma, China, Malaya, New Caledonia.

One of our commonest and most widely distributed species. All (?) our specimens are referable to the variety *F. nitida*, Thunb., but vary much in size and breadth of leaf. The high montane form has obovate broad very obtuse leaves, and the basal bracts of the fruit very large. The recepts. are often converted into densely hairy galls, twice the size of the normal ones. C. P. 2357 is referred to *F. Tsiela*, Roxb. by King, but in Herb. Perad. seems rather the present species.

9. **F. nervosa,** *Heyne in Roth, Nov. Sp.* 388 (1821). **Kaluma-duwa,** *S.*

Urostigma modestum, Miq.; Thw. Enum. 266. King, Fic. 53. C. P. 2219.

Fl. B. Ind. v. 512. Wight, Ic. t. 660 (*F. angustifolia*). King, Fic. t. 65.

An evergreen tree, young parts appressed pubescent; branchlets slender; l. $\frac{1}{2}$–1 in., oblong-lanceolate to oblong-obovate or oblanceolate, cuspidately caudate, base narrowed, shining on both surfaces, veins 5–7 pairs, slender, nearly horizontal, but arching, basal 3–5 pair, very short, margins subundulate; petiole $\frac{1}{2}$ to $\frac{3}{4}$ in., slender; stip. ovate-lanceolate, membranous; recepts. axillary, binate, globose, $\frac{1}{2}$–$\frac{2}{3}$ in. diam., puberulous, young subverrucose, ped. $\frac{1}{2}$–$\frac{2}{3}$ in., slender, pubescent; bracts at base of recepts. 0, at base of ped. 3, small, rounded ovate; male fl. few, pedicelled, sep. 2, unequal, spathulate; stam. 1, fil. adnate to one sep.; gall and fert. fem. fl. sessile or pedicelled, sep. 3, unequal, lanceolate, acuminate, style half as long as the ovoid achene, stigma simple or 2-fid.

Moist region up to 5000 ft.; rather rare. Heneratgoda, abundant; Hantane; Hunasgiriya; Maturata. Fl. August, December.

India, Burma, China, Malaya.

The Ceylon tree is var. *minor*, King, and differs from the continental type in its smaller leaves, with fewer lateral veins, and globose recepts.

F. religiosa, L., *Bo*, S., *Arachu*, T. (C. P. 3672), is a commonly planted tree, and invariably found by every Buddhist temple, but is nowhere wild. The sacred tree at Anuradhapura, brought from Magadha, in India, in B.C. 288, and carefully tended and guarded ever since, is not improbably the original source of all the trees in Ceylon. It is wild in the sub-Himalayan forests only. There are specimens in Hermann's Herb. (see Mus. Zeyl. 42, and Fl. Zeyl. n. 372).

10. **F. Arnottiana,** *Miq. Ann. Mus.* iii. 287 (1867). **Kaputo-bo,** *S.*

Urostigma Arnottianum, Miq., Thw. Enum. 264. King, Fic. 56. C. P. 2856.

Fl. B. Ind. v. 513. King, Fic. tt. 68 and 84, f. v.

A glabrous tree or shrub; l. 3–8 in., broadly ovate or deltoid, obtusely caudate-acuminate, minutely reticulate above, subcoriaceous, base truncate or cordate, veins 5–7 pairs, slender, all strongly arched, basal 3 pairs; petiole 2–6 in.; stip. $\frac{1}{2}$–1 in., ovate-lanceolate; recepts. mostly at the scars of fallen leaves, binate or clustered on tubercles, subsessile, depressed-globose, $\frac{1}{4}$–$\frac{1}{3}$ in. diam., smooth, dotted; basal bracts 3, brown, membranous; male fl. few, sessile; sep. 3, loose, inflated, broad, acuminate, much larger than the small subsessile solitary anth.; gall and fert. fem. fl. alike; perianth lax, toothed, embracing the ov., style and stigma both long.

Dry and intermediate region; rather rare. Trincomalie; Lunagala, Uva; Haragama. Fl. June–August. Fr. yellow-brown or purplish.

Also in S. India.

11. **F. Mooniana,** *King, Ficus,* 57 (1887).
Urostigma Wightianum, var. *majus,* Thw. Enum. 265. C. P. 2464.
Fl. B. Ind. v. 514. King, Fic. tt. 69 and 84, f. w.

A large glabrous tree; branchlets stout, rough; l. $4\frac{1}{2}$–$6\frac{1}{2}$ in., oval or ovate-oblong, cuspidate or obtusely caudate, minutely reticulate, margin entire, minutely undulate, base rounded cuneate or narrowed into the petiole, veins 10–15 pairs, rather strong, spreading, basal short; petiole very variable, 1–$2\frac{1}{4}$ in.; stip. about $\frac{1}{3}$ in., puberulous; recepts. solitary or binate, peduncled, crowded below the tips of the branchlets, globose, $\frac{1}{3}$–$\frac{1}{2}$ in. diam., smooth, dotted; basal bracts 3, broadly ovate; ped. $\frac{1}{2}$ in., stout; male fl. few, sessile, sep. 3, lanceolate; stam. 1, fil. as long as the ovate apiculate anth.; gall and fert. fem. fl., with a 4-toothed perianth, shorter than the ov.; achene obovoid, style and stigma long.

Moist region up to 3000 ft.; rather common. Fl. Jan.–May. Fr. orange-red and punctate.
Endemic.

12. **F. Tsjakela,*** *Burm. Fl. Ind.* 227 (1768). **Kiripella,** *S.*
Pella ribesioides, Gaertn. Fruct. i. 143. *Ficus indica,* Moon, Cat. 74 (non L.). *Urostigma ceylonense,* Miq. in Lond. Journ. Bot. vi. 568. *U. infectorium,* Thw. Enum. 265 (non Miq.). C. P. 2931, 3083.
Fl. B. Ind. v. 514. Gaertn. Fruct. i. t. 28, f. 8 (fruit). King, Fic. tt. 70, 84, f. x.

A large deciduous much-branched tree, aerial roots 0; branchlets stout, scarred; bud scales 3–5 in., lanceolate, membranous, caducous; l. 3–5 in., linear-oblong, acute, thinly coriaceous, obtusely acuminate or cuspidate, bright green and shining above, base rounded or acute, veins, 7–10 pairs, slender, spreading, basal 1–2 pairs not conspicuous; petiole $1\frac{3}{4}$–$2\frac{1}{2}$ in.; stip. small, ovate-lanceolate; recepts. solitary and clustered on rameal tubercles, subsessile, depressed globose, $\frac{1}{5}$–$\frac{1}{4}$ in. diam., smooth, dotted; basal bracts 3, broad, deeply 2-fid.; male fl. few, sessile; sep. 3, ovate, acuminate; stam. 1, fil. larger than the ovate anther; gall and fert. fem. fl. similar, sep. 3–4; achene obovate, style long, stigma cylindric.

Moist region to 2000 ft.; rather common. Fl. March–April, Jan., July. Fr. not larger than a pea, dull grey-purple with pale spots.
Also in Peninsular India.
The tree is quite deciduous for a few days during the dry season. When coming into leaf the very large thin leaf-scales are very conspicuous, but they quickly fall. Gaertner's figure of the fruit is fairly good, but he mistook it for a berry, hence the synonyms he quotes are incorrect.

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* *Tsjakela* is the vernacular name given for this in the Hortus Malabaricus, iii. 87, t. 64.

13. **F. Tsiela,*** *Roxb. Fl. Ind.* iii. 549 (1832). **Ela-nuga, Ehétu,** *S.* **Kalatti,** *T.*

Urostigma Tjiela, Miq., Thw. Enum. 265 (part). King, Fic. 59. C. P. 2218.

Fl. B. Ind. v. 515. Wight, Ic. t. 668. King, Fic. tt. 74, 81, f. z 2.

A tall glabrous tree, with spreading branches, aerial roots 0; bark smooth, greenish; l. 2–4½ in., ovate or ovate-oblong or lanceolate, acute or obtusely cuspidate, thinly coriaceous, entire with a thick marginal nerve, base narrowed or rounded, veins 8–10 pairs, slender, arched, basal short; petiole 1⅓–2 in.; stip. ½–1 in., ovate, acuminate; recepts. crowded towards the ends of the branches, sessile, globose, ½–⅔ in. diam., smooth; basal bracts 3, minute, broadly ovate, scarious; male fl. few, sessile, sep. 3, ovate, acuminate, longer than the solitary stam.; stam. 1, fil. clavate, much larger than the broadly ovate anth.; fem. and gall fl.:—sep. 3, ovate, longer than the ovoid achene, style long, stigma very long, cylindric.

Dry and intermediate region; rather common. Hanguranketa; Maturata; Ekiriankumbura; Puttalam; Pomparippu; Anuradhapura; Matale. Fl. Sept. Fr. purple.

Also in S. India.

The leaves when dry have the upper surface covered with minute raised dots.

14. **F. infectoria,** *Roxb. Fl. Ind.* iii. 550 (1832) (non Willd.). King, Fic. 59. *F. Lacox*, Ham.

Fl. B. Ind. v. 515. Wight, Ic. t. 665. King, Fic. t. 75.

A moderate-sized low glabrous deciduous tree; l. 3½–7 in., ovate or ovate-oblong, cuspidate, thin, base broad, rounded, emarginate or subcordate, rarely narrowed, veins 5–7 pairs, slender, basal pair conspicuous; petiole 1½–2 in., sometimes obscurely jointed with the blade; stip. ½ in., broadly ovate, acute, pubescent; recepts. binate, axillary, sessile, globose, ¼–½ in. diam., dotted, ped. $\frac{1}{10}$–⅙ in.; basal bracts 3, minute orbicular-ovate; male fl. few, sessile, sep. 4–5, linear, stam. 1, fil. short, anth. broadly ovate; gall and fert. fem. fl.; sep. of male, style of fert. fem. long, of gall fl. short, stigma elongate.

Var. *β*, **Lambertiana,** *King, Fic.* 63. **Kalaha,** *S.*

Urostigma Wightianum, Miq., Thw. Enum. 265. *U. Lambertianum*, Miq. C. P. 2223.

Fl. B. Ind. v. 515. King, Fic. t. 76.

L. 1½–4 in., coriaceous, broadly ovate or oblong, obtusely

* *Tsiela* is the vernacular name given for this in the Hortus Malabaricus, iii. 85, t. 63. Miquel's '*Tjiela*' was clearly a misprint.

cuspidate, base broad, rounded, emarginate or subcordate, basal pair of veins very short, recepts. $\frac{1}{3}$–$\frac{1}{2}$ in. diam., ped. $\frac{1}{5}$–$\frac{1}{3}$ in., puberulous.

Low country; rare. Pasdun Korale; Foot of Ritigala, N. C. Prov. Var. β moist and intermediate country to 6000 ft.; Fl. March-Sept. Fr. white or pink when ripe, and dotted.

The leaves vary much in size; in the hills they are often much smaller, and the plant is then probably *F. Wightiana*, Wall. (King, Fic. t. 77). The bark is chewed with betel.

F. Lacox, Ham. in Trans. Linn. Soc. xv. (1827) 150, seems the earliest name for this species.

15. **F. callosa,** *Willd. in Act. Acad. Berol.* 102 (1798). **Walgona,** *S.*

F. cinerascens, Thw. Enum. 266. King, Fic. 64. C. P. 2562.
Fl. B. Ind. v. 516. King, Fic. t. 85 and 84, f. v. 2.

A large evergreen tree, 40–60 ft.; branchlets hoary, warted; l. 5–8 in. (on barren shoots up to 12 in. or more), oval or oblong, entire, obtusely cuspidate, very coriaceous, margin recurved entire, base broad, rounded or narrowed into the petiole, pale, smooth and shining above, beneath pale, pubescent when young, scaberulous when old, and strongly reticulate, veins strong beneath, lateral 5–12 pairs, spreading and arched, basal short, slender above; petiole $1\frac{1}{6}$–$1\frac{3}{4}$ in.; stip. $\frac{1}{2}$ in. or shorter, ovate-lanceolate, pubescent; recepts. solitary, axillary, subglobose, top slightly depressed, 1 in. diam., pubescent and scabrid, ped. $\frac{3}{4}$ in.; bracts on the top of the ped. 3, broadly ovate; fl. mixed with many ovate-lanceolate bracteoles; male rather numerous, scattered, pedicelled, sep. 3, spathulate; stam. 1 or 2, fil. short, slender, anth. small, ovate; gall and fert. fem. fl. similar, perianth deeply 3–4-cleft, segm. broadly lanceolate, style elongate, 2-fid.; achene obovoid.

Low country up to 2000 ft.; rather rare. Hantane; Peradeniya; Kurunegala; Maturata. Fl. Sept. Fr. yellow.

S. India, Andaman Is., Burma, Java.

16. **F. heterophylla,** *L. f. Suppl. Plant.* 442 (1781). **Walébétu,** *S.*

Thw. Enum. 266. King, Fic. 75. C. P. 2228.
Fl. B. Ind. v. 518. Wight, Ic. 659. King, Fic. t. 94.

An evergreen creeping or ascending shrub; branches pubescent; l. polymorphous, ovate or orbicular-ovate to lanceolate, acuminate, entire or 3–many-lobed and repand-toothed, membranous, scabrid on both surfaces, base obtuse rounded or cordate, veins 4–8 pairs, arched, sometimes palmately disposed, basal 3–5; petiole $\frac{1}{2}$–$2\frac{1}{2}$ in.; stip. $\frac{1}{3}$–$\frac{1}{2}$ in.,

ovate, scarious; recepts. solitary, axillary, spherical to narrowly pyriform, $\frac{1}{4}$–1 in. long, umbilicus prominent, open, young hispid scabrid or warted, ripe smooth; ped. $\frac{1}{2}$–1 in.; bracts basal or high up on the ped., minute, triangular; perianth of all fl. 3–4-cleft; male fl., stam. 1; ov. of gall fl. ovoid, smooth, style lateral; achene subglobose, perianth hyaline, viscid, tubercled, style long, lateral, stigma cylindric.

Low country in damp places; said to be common. Fl. (?) Fr. yellow. India and Malaya.

The foliage is extremely variable in form on the same plant.

17. **F. asperrima,** *Roxb. Fl. Ind.* iii. 554 (1832). **Sewana-médiya,** *S.*

F. politoria, Moon, Cat. 74 (non Lam.). Thw. Enum. 266. King, Fic. 80. C. P. 2229.

Fl. B. Ind. v. 522. Wight, Ic. t. 633. King, Fic. t. 100.

A shrub or small tree; young parts scabrid; l. crowded towards the tips of the branchlets, oval ovate obovate or oblong-lanceolate, cuspidate or caudate, serrate toothed or crenate in upper part, scabrid and hispid on both surfaces, base obtuse or rounded, strongly reticulate beneath with cross venules, veins 3–5 pairs, strong beneath, basal pair prominent; petiole $\frac{1}{2}$–2 in., stout; stip. minute; recepts. solitary, peduncled, globose, $\frac{1}{2}$–$\frac{3}{4}$ in. diam., top depressed, oval bracts erect, basal 0, ped. minutely bracteate; male fl., sep. 4–5, linear-lanceolate, scabrid, stam. 1; gall-fl., sep. of male, ov. ovate-lanceolate, style thick, stigma dilated; fert. fem. fl., sep. 6–7, linear-lanceolate, smooth; achene elongate obovoid, minutely tubercled, style lateral, stigma obovate.

Moist region up to 3000 ft.; common. Fl. (?) Fr. orange-yellow, or pale yellow with orange spots.

Also in Peninsular India.

The young leaves are sometimes deeply incised. This is the 'Furniture-leaf' of the English, and is generally in use for polishing, as sand-paper in Europe.

18. **F. hispida,** *L. f. Suppl. Pl.* 442 (1781). **Kota-dimbula,** *S.*

F. oppositifolia, Willd., Moon, Cat. 74. *Covellia oppositifolia*, Gasp., Thw. Enum. 266. King, Fic. 116. C. P. 2230.

Fl. B. Ind. v. 522. Wight, Ic. t. 638, and (*F. dæmonum*) 641. King, Fic. tt. 154, 155.

A hispidly pubescent shrub or small tree; l. opp., 4–12 in., oval ovate ovate-oblong or subobovate, apiculate, cuspidate or caudate, entire or toothed above the middle, base rounded cuneate or cordate, veins 3–5 pairs, strong beneath and reticulate with cross venules, basal pair strong; petiole $\frac{1}{2}$–$1\frac{1}{2}$ in. (3–$3\frac{1}{2}$ on young shoots), densely hispid; stip. binate, or 4-whorled on leafy branches, ovate-lanceolate, pubescent;

recepts. axillary, binate or fascicled on tubercles or shoots of the old wood, turbinate or subpyriform, $\frac{1}{2}$–1 in. diam., hispid, with sometimes adnate lateral bracts, umbilicus rather large; ped. $\frac{1}{5}$–$\frac{2}{3}$ in., basal bracts, 3; male fl., sep. 3, concave, hyaline, stam. 1, fil. broad; gall and fert. fem. fl. pedicelled, naked; achene ovoid, style long, hairy, stigma cylindric, tubular.

Low country to 3000 ft.; common. Fl. Nov., Dec., July. Fr. yellowish. India, Malaya, China, Australia.

19. **F. Thwaitesii,** *Miq. Ann. Mus.* iii. 229 (1867).
Fl. Zeyl. n. 438 (*Oxycoccoides*). *F. stipulata*, Moon, Cat. 74 (non Thunb.). *F. diversiformis*, Miq. in Lond. Journ. Bot. vii. 441; Thw. Enum. 266. *F. disticha*, Thw. Enum. 266 (non Bl.). King, Fic. 125. C. P. 2217, 2224, 3116.
Fl. B. Ind. v. 525. King, Fic., t. 159, f. B.

A dimorphous plant; stem of young plant filiform, creeping, appressed to the bark of trees or to rocks, of old erect, stout, shrubby, with tomentose branches; l. of young state distichous, appressed to the bark, $\frac{1}{3}$–1$\frac{1}{4}$ in. long, oblong, obtuse, entire or 3-lobed, base cordate or hastate; of mature plant 1–4 in., oval ovate or obovate, obtuse, coriaceous, subscabrid above, tessellately reticulate with pubescent veins beneath, veins 2–4 pair, strong, basal pair short; petiole $\frac{1}{10}$–$\frac{1}{4}$ in.; stip. binate, ovate, acuminate, scarious; recepts. subsolitary, axillary, globose or oblong, about $\frac{1}{3}$ in. diam., narrowed into a slender ped. about $\frac{1}{2}$ in. long; bracts 3, above the middle or at the top of the ped., small, broadly obovate; male, gall, and fert. fem. fl. mixed; sep. 2–3, short, broadly obovate; anth. 2, much longer than the sep.; achene obliquely ovoid, shining, of the gall fl. ridged.

Climbing over rocks and trees in the moist region up to 5000 ft.; rather common. Colombo; Hantane; Allogula; Matale; Dolosbagie; Hunasgiriya; Morowak Korale. Fl. March, September. Fr. pale pinkish-yellow or nearly white.

Endemic.

The slender creeping rooting stems look very unlike the free fruiting branches, and are the *F. diversiformis*, Miq. (C. P. 2217). This is the earliest name for the species, but it was given merely to the barren stems.

20. **F. lævis,** *Bl. Bijd.* 437 (1825), var. **dasyphylla,** King, Fic. 128.
Pogonotrophe dasyphylla, Miq. in Lond. Journ. Bot. vii. 74; Thw. Enum. 266. *P. ceylanica*, Miq. l. c. 75. *F. ceylanica*, Miq. Ann. Mus. iii. 293; Trim. Syst. Cat. 84. C. P. 233.
Fl. B. Ind. ii. 526. King, Fic. t. 161.

A powerful epiphyte, young parts pubescent; l. 4–7 in., orbicular or broadly oblong, abruptly caudate, entire or subserrate towards the tip, glabrous above, beneath appressed

pubescent, rarely glabrous, base broad rounded or cordate, rarely narrowed, veins 3–4 pairs, strong, basal long; petiole $1\frac{1}{2}$–4 in.; stip. ovate-lanceolate, $\frac{1}{3}$–$\frac{1}{2}$ in.; recepts. axillary, subsolitary, globose or subpyriform, $\frac{1}{2}$–1 in. diam., tomentose, densely hispid within, umbilicus broad, ped. $\frac{1}{2}$–1 in., hirsute; basal bracts 3, small, triangular-ovate; male and gall fl., sep. 5, linear-lanceolate, male fl., stam. 2–3, anth. elongate, subsagittate; achene of gall fl. globose, smooth, style subterminal, stigma dilated; fert. fem. fl. pedicelled, achene elongate ovoid, style nearly as long, terminal.

Moist region 1–4000 ft.; rather rare. Ratnapura; Ambagamuwa; Adam's Peak; Hantane; Hunasgiriya; Knuckles Mts. Fl. March–June. Fr. clothed with dull brownish orange tomentum.

E. Bengal, Burma, Malaya.

21. **F. glomerata,** *Roxb. Cor. Pl.* ii. 13 (1798). **Attika,** *S.* **Atti,** *T.*

Moon, Cat. 74. *Covellia glomerata*, Miq., Thw. Enum. 266. King, Fic. 173. C. P. 3305.

Fl. B. Ind. v. 535. Wight, Ic. t. 667. King, Fic. t. 218.

An evergreen tree, 50–60 ft.; shoots glabrous, pubescent or scaberulous; l. 4–7 in., oblong-ovate to obovate or lanceolate, tapering to an obtuse apex, entire, membranous, glabrous on both surfaces, shining above, base obtuse, rarely acute, veins 4–6 pairs, strong beneath; petiole $\frac{3}{4}$–2 in.; stip. $\frac{1}{2}$–$\frac{3}{4}$ in., linear-lanceolate, membranous; recepts. shortly pedunculed on short warted branches, subglobose, pyriform or subturbinate, $1\frac{1}{4}$ in. diam., glabrous or pubescent, umbilicus depressed; basal bracts 3, triangular-ovate; male fl. sessile, sep. 3–4, membranous, inflated, enveloping the 2 elongate-ovate anths., fil. connate; gall-fl. pedicelled, perianth toothed, covering the base of the ovoid, rough ov., style lateral, elongate, stigma clavate; fert. fem. fl. in a zone between the male and gall fl., subsessile, perianth 4–5-toothed, teeth lanceolate, enveloping the small minutely tubercled achene, style subterminal, much elongate, stigma clavate.

Banks of rivers and streams, moist low country to 2000 ft.; common. Fl. November. Fr. reddish.

India and Burma.

This has much the largest fruits of the Ceylon species; they are scarcely edible. The juice of the stem is called 'Kallu toddy,' and is used by the Tamils in diabetes.

6. ANTIARIS, *Leschen.*

Evergreen trees; l. alt., bifarious, penniveined, stip. small, connate, caducous; fl. monœcious, male crowded on the

surface of an axillary peduncled receptacle, surrounded by confluent imbricating bracts, fem. minute, solitary in a pyriform involucre of many confluent bracts; male fl.:—sep. 3–4, narrowly spathulate, imbricate; stam. 3–8, fil. erect; pistillode 0; fem. fl.:—perianth 0; ov. adnate to the involucre; style arms 2, subulate, recurved, ovule pendulous; ft. fleshy, pericarp confluent with the receptacle, testa hard, endosperm 0, embryo subglobose, fleshy, radicle small, superior.—Sp. 5–6 or 1; 1 in *Fl. B. Ind.*

A. toxicaria, *Leschen. in Ann. Mus. Par.* xvi. 478 (1810). **Riti,** *S.* **Netavil,** *T.*

A. zeylanica, Seem. in Bonplandia, x. 4. *A. innoxia*, Bl., Thw. Enum. 263. *A. saccidora*, Dalz.; Wight, Ic. vi. 7. C. P. 2231.

Fl. B. Ind. v. 538. Wight, Ic. t. 1958. Bedd. Fl. Sylv. t. 307.

A tall tree, 120 ft., trunk straight, with buttressed base; bark grey, pustular; l. 4–8 in., oblong or oval-oblong, acuminate, mucronate, cuspidate or subcaudate, entire or serrulate, glossy above, glabrous or tomentose beneath, base rounded or cordate, young hirsute, veins 8–10 pairs; petiole very short; recepts. 3–4-nate, orbicular, $\frac{1}{2}$ in. diam., velvety, at length convex; fem. recept. axillary, subsessile, ovoid, $\frac{1}{8}$ in., velvety; fr. globose or pyriform, $\frac{1}{3}$–$\frac{3}{4}$ in. diam., narrowed into a short ped., red-brown, 1-seeded.

Low country to 2000 ft., rather common. Heneratgoda; Kurunegala; Kaduganawa; Badulla. Fl. August, September. Fr. red-purple.

Also in S.W. India, Burma, Malaya.

First collected by Gardner at Kurunegala in 1847. His specimens are labelled '*A. acuminata*, Gardn.', a name never published (see his 'Remarks on Flora of Ceylon' (1848), p. 7).

There are no sufficient botanical characters to separate this from the Upas tree of Java, the original *A. toxicaria;* but the milky juice here seems far less poisonous, and does not appear to be even used as a medicine. The two trees grow side by side in Peradeniya Gardens, and the only differences in the foliage of the Ceylon plant are that its leaves are somewhat narrower, less acute, less cordate at the base, and with more numerous lateral veins.

The very tough inner bark readily separates from the wood, and, removed entire from large stems, affords excellent ready-made sacks. The fig-like fruits are reddish-purple when ripe, and the flesh is eaten by bats and birds; the seed is bitter. The lateral branches disarticulate naturally, leaving a clean scar or stem.—*Trimen.*

7. CUDRANIA, *Tréc.*

Erect or scandent, small, often spinous trees or shrubs; l. alt., quite entire, penniveined, stip. small; fl. diœcious, in small naked globose heads, bracteolate; male fl.:—sep. 3–5, imbricate, adnate to 2–4 bracts, stam. 4, fil. erect; pistillode

styliform; fem. fl.:—sep. 4, ov. straight, style terminal, simple or 2-fid, ovule pendulous; fr. of achenes, bracts and sep., forming together a globose or ovoid compressed fleshy head, testa membranous, endosperm scanty, cotyledons twisted or folded, radicle slender, upcurved.—Sp. 3 or 4; 1 in *Fl. B. Ind.*

C. javanensis, *Tréc. in Ann. Sc. Nat. ser.* 3, viii. 123 (1847).
Cudranus Rumphii, Thw. Enum. 262. *Plecospermum cuneifolium*, Thw. in Journ. Bot. vi. 303. C. P. 2526.
Fl. B. Ind. v. 538. Rumph. Herb. Amboin. v. tt. 15, 16. Bedd. Fl. Sylv. t. anal. 27, f. 1.

A straggling or scandent shrub; branchlets red-brown, drooping; spines straight or recurved; l. 1–3 in., obovate oblong or oblanceolate, obtuse acute or acuminate, glabrous, reticulate, veins 8–10 pairs, slender, base acute or obtuse; petiole ¼ in.; fl. heads solitary or 2-nate, sessile or shortly peduncled, pubescent, male about ¼ in. diam.; sep. cuneiform, unequal, hairy; fem. sep. 4, tips thickened, velvety; fr. 2–3 in. diam., glaucous green, velvety.

Low country in dry and intermediate zone; rare. Haldummulla; Kindagodda; Rikiligaskodde. Fl. April.
E. Bengal, Burma, Malaya, Australia, E. Africa.
Has much resemblance to *Plecospermum spinosum.*

8. ARTOCARPUS, *Forst.*

Evergreen trees; l. alt., entire lobed or pinnatifid, penni-veined; fl. monœcious, male in catkin-like spikes; fem. crowded on oblong or globose axillary or terminal receptacles, with often peltate bracteoles; male fl.:—perianth 2–4-lobed or-partite; stam. 1, fil. erect; pistillode 0; fem. fl.:—perianth tubular, base confluent with the recept., mouth minute; ov. straight, style entire or 2-fid, ovule pendulous; achenes (anthocarps) sunk in the enlarged fleshy receptacle, their exposed tops flat pyramidal or spinescent; seed oblong or subglobose, endosperm 0.—Sp. about 40; 18 in *Fl. B. Ind.*

Fem. recepts. oblong . . . . 1. A. NOBILIS.
Fem. recepts. globose . . . . 2. A. LAKOOCHA.

1. **A. nobilis,** *Thw. Enum.* 262 (1861). **Del, Bedi-del,** *S.*
A. pubescens, Moon, Cat. 61 (non Willd.). King in Ann. Calc. Gard. ii. 12. C. P. 2818.
Fl. B. Ind. v. 542. Bedd. Fl. Sylv. t. 309. King, l. c. t. 10.

A tree 40–50 ft., hispidly scabrid on the very stout branchlets petiole and veins of l. beneath; l. 6–14 in., broadly

ovate, cuspidate, margin sinuate, young pinnatifid, base narrowed or rounded, coriaceous, rough on both surfaces, veins about 9 pairs and midrib yellow; petiole $\frac{3}{4}$–$1\frac{1}{2}$ in., very stout; stip. 3–5 in., spathiform; recepts. covered with stipitate, peltate, hairy bracteoles, male 3–6 in., cylindric, ped. 1–3 in.; sep. 2, broad, truncate; fr. 6–8 in., oblong or cylindric, surface lobulate, tops of anthocarps nearly flat, 4-5-angled; seed subglobose, about $\frac{1}{2}$ in. diam.

Moist low country up to 2000 ft.; common. Fl. June.
Endemic.

The outer shells of the seeds roasted are good eating. The wood is in great request for cabinet-making, and fishing boats are made out of its hollowed trunks.

2. **A. Lakoocha,** *Roxb. Fl. Ind.* iii. 524 (1832). **Kana-gona,** *S.*
Thw. Enum. 262. King, l. c. 14. C. P. 2831.
Fl. B. Ind. v. 543. Wight, Ic. t. 681. King, l. c. t. 13.

A large deciduous tree, with a spreading head; bark rough; branchlets fulvous-tomentose; l. 4–12 in., oblong or subobovate, obtuse, cuspidate, base broad or narrow rounded or cordate, entire, or young serrate, thinly coriaceous, glabrous and shining above, softly pubescent beneath, veins 4–12 pairs; petiole $\frac{1}{2}$–1 in.; stip. $\frac{1}{2}$ in., lanceolate, tomentose; recepts. axillary, globose, bracteoles peltate, puberulous, male $\frac{1}{2}$–$1\frac{1}{2}$ in. diam., sep. 2–3, triangular, truncate, puberulous; fr. 2–4 in. diam., lobulate, smooth, velvety, yellow, tops of anthocarps smooth; seeds few, about $\frac{1}{2}$ in. diam., broad, flat.

Var. β, **Gomeziana,** *Wall.* (sp.) Thw. Enum. 262. King, l. c. t. 14 A. C. P. 2232.

L. glabrous on both surfaces, or puberulous on the midrib and veins.

Moist region up to 3000 ft.; rather rare. The type, Ratnapura; Morowaka. Var. β, Colombo; Kalutara; Hantane. Fl. March–April and September.

India, Burma, Andaman Is., Malay Penins.

I cannot make two species of the Ceylon material; our var. β may not be the true *A. Gomeziana*, Wall., which is maintained as a species by King, but not given for Ceylon.—*Trimen.*

The seeds are eaten, but the tree is not cultivated.

Artocarpus integrifolia, L. f., is the well-known Jack tree, *Kos*, S., *Pila*, T., universally cultivated in the low country for its fruit, but nowhere wild in Ceylon. It is stated, in Fl. B. Ind. v. 541, to have been found wild by Beddome in the forests of the western Ghats of India, but it is not included in King's Monograph of the Indian species, who had not this information in time. I have no knowledge as to the time of its introduction to Ceylon, but no doubt it was at a very distant period; curiously, Hermann has not any specimen or drawing. There are good figures in Rheede, Hort. Malab. iii. tt. 26–28, Gaertn. Fruct. i. tt. 71, 72 (*Sitodium cauliflorum*), and Bot. Mag. t. 2833–4. It is C. P. 2233. The timber is excellent.—*Trimen.*

9. TAXOTROPHIS, *Bl.*

Spinous trees or shrubs; l. alt., penniveined; stip. small, connate; fl. diœcious, male sessile, minute, globose, crowded in short axillary spikes, fem. pedicelled in axillary and terminal few-fid. racemes; male fl.:—sep. 4, orbicular, valvate; stam. 4, fil. inflexed in bud; pistillode short, stout; fem. fl.:—sep. 4, persistent; ov. gibbously oblong, with the ovarian cavity on one side, styles 2, rather long, simple, spreading; ovule pendulous; fr. gibbously oblong, fleshy, lower half solid, upper with a rounded summit and the styles lateral; seed immersed nearly horizontally in the upper part of the fr., endosperm 0, cotyledons crumpled, radicle up-curved.—Sp. 3 or 4; 1 in *Fl. B. Ind.*

T. zeylanica, *Thw. Enum.* 264 (1861).

Epicarpurus zeylanica, Thw. in Kew Journ. Bot. iv. 1. *Diplocos zeylanica*, Bureau in DC. Prod. xvii. 215. C. P. 2213.

Fl. B. Ind. v. 488. Kew Journ. Bot. iii. t. 11. Bedd. Fl. Sylv. t. anal. 26, f. 3.

A shrub or small much-branched tree, 8–10 ft., sparingly spinous, tips of branchlets hairy; spines long, straight; bark brown; l. $1\frac{1}{2}$–3 in., lanceolate or rhombic-lanceolate, obtusely acuminate, serrate, narrowed into the acute or narrowly cordate base, or into the short hairy petiole, flaccid; male spikes pale yellow, $\frac{1}{4}$–$\frac{1}{2}$ in., shortly ped.; bracts minute; fem. racemes about 1 in., fl. minute, green, ped. thickened upwards, elongating often to 1 in. after flg.; stigmatic villi brown; seed globose.

Low country, 1–2000 ft.; rather rare. Kurunegala; Haragama; Hantane. Fl. July. Male yellow, fem. green.

Also in Burma.

10. PHYLLOCHLAMYS, *Bureau.*

Spinous, quite glabrous trees or shrubs, juice milky; l. alt., penniveined; stip. lateral, free; fl. diœcious, male minute in axillary involucrate sessile pisiform heads, fem. much larger, but solitary, pedicelled, not involucrate; male fl.:—sep. 3–4, obtuse, imbricate; stam. 3–4, fil. inflexed in bud; pistillode short, top dilated; fl. fem.:—sep. 3–4, lanceolate, greatly enlarged and foliaceous in fr.; ov. subglobose, at length oblique, styles 2, lateral, ovule pendulous; fr. a gibbous fleshy achene, much shorter than the sep., subglobose, top umbonate; seed obliquely placed in the upper part of the achene,

globose, endosperm scanty, cotyledons very unequal, the larger 2-fid., enclosing the smaller, radicle up-curved.—Sp 2 or 3; 1 in *Fl. B. Ind.*

P. spinosa, *Bureau in DC. Prod.* xvii. 218 (1873). **Gongotu,** *S.*
Taxotrophis Roxburghii, Bl., Thw. Enum. 264. C. P. 1074.
Fl. B. Ind. v. 488. Wight, Ic. t. 1962 (*Epicarpurus spinosus*). Bedd. Fl. Sylv. t. anal. 26, f. 2.

A small, gnarled, evergreen tree; branches stout, woody, and spines strong, striate; bark pale; l. subsessile, 2–4 in., obovate or oval-oblong or subrhombic, caudate or acuminate, remotely coarsely serrate or subentire, base acute rounded or contracted and cordate, veins 5–7 pairs, not strong; male clusters subglobose, $\frac{1}{3}$ in. diam.; invol. of many lanceolate acuminate bracts much longer than the fl.; sep. pubescent, nearly orbicular; fem. fl., long pedicelled, fruiting sep. $\frac{1}{2}$–1 in., caudate-acuminate, base cordate; achene size of a cherry; seed immersed in the tumid upper part of the achene which is fleshy below the middle.

Dry region; rather common. Mineri; Haragama; Nalande. Fl. July–Sept.; male whitish, fem. green.
S. India, Andaman Is., Burma, Malay Is.

11. STREBLUS, *Lour.*

Unarmed shrubs or trees, juice milky; l. alt., scabrid, penni-veined; stip. subulate; fl. axillary, mono-diœcious, male minute in shortly ped. pisiform heads, fem. larger, solitary or 2-3 nate; male fl. subsessile, sep. 4, imbricate; stam. 4, fil. inflexed in bud; pistillode short, top dilated; fem. fl.:—sep. 4, unequal, broad, concave; ov. straight, styles 2, terminal, long, slender, ovule pendulous; achene subglobose, enclosed in the accrescent sep., pericarp thick; seed globose, endosperm 0, cotyledons very unequal, the larger fleshy enfolding the smaller, radicle upcurved.—Sp. 2, both in *Fl. B. Ind.*

S. asper, *Lour. Fl. Cochinch.* 615 (1790). **Géta-netul,** *S.* **Patpiray, Pirasu,** *T.*
Trophis aspera, Retz., Moon, Cat. 88. Thw. Enum. 264. C. P. 2214.
Fl. B. Ind. v. 489. Wight, Ic. t. 1961 (*Epicarpurus orientalis*). Bedd. Fl. Sylv. t. anal. 26, f. 1.

A shrub or small gnarled tree, unarmed; branchlets pubescent or tomentose; l. 1–3 in., ovate, obovate or rhomboid, acute or acuminate, coarsely toothed from below the middle, base acute, scaberulous on both surfaces, but especially beneath, veins 4–6 pairs; petiole $\frac{1}{12}$–$\frac{1}{6}$ in.; male heads solitary

or binate, sometimes androgynous; fl. 3-bracteate, pubescent; fl. fem. on slender ped. that are thickened upwards; fr. pisiform, embraced by the persistent sepals, style persistent, $\frac{1}{4}$-in. long.

Low country to 2000 ft.; common. Fl. March, April; yellow.
India, Malaya, China.
The yellow fruit is edible, but the bark is said to be an irritant poison. The wood is white, elastic, without annual rings. The leaves are employed for polishing, instead of sand-paper; and pieces of the wood are used as tooth-brushes by the natives.

12. **DORSTENIA,** *L.*

Herbs or small shrubs, often succulent; l. alt., penniveined; stip. lateral; fl. monœcious, minute, crowded, males on the surface, fem. sunk in the substance of an expanded simple or lobed androgynous receptacle, which is bordered by bracts; male fl.:—perianths more or less connate, 2-lobed, or toothed; stam. 1–3, fil. inflexed in bud; pistillode 0; fem. fl.:—perianth adnate to the receptacle and ov., limb obscure, style simple, lateral, exserted, ovule pendulous; achene minute, pericarp crustaceous, endosperm 0, cotyledons subequal, contorted, embracing the upcurved radicle.—Sp. about 45; 1 in *Fl. B. Ind.*

D. indica, *Wall. Cat. n.* 4639 (1828).
D. radiata, Moon, Cat. ii. (non Lam). Thw. Enum. 264. Bureau in DC. Prod. xvii. 272. C. P. 29, 519.
Fl. B. Ind. v. 494. Wight, Ic. t. 1964.

An erect or ascending sparsely hairy herb, stem. 3–10 in., stout or slender; l. 2–3½ in., obovate-lanceolate, oval or ovate, acuminate, sinuate-toothed, base acute, veins about 10 pairs; petiole ½–1 in.; recept. $\frac{1}{3}$–$\frac{2}{3}$ in. diam., peltate, rounded or angular, with 5–12 linear, obtuse, pubescent arms spreading from the margin, ped. 1–1½ in., gradually thickened upwards, and angular.

Shady places, principally in woods in the moist region 4–6000 ft., common; also in the dry region rarely. Dambulla. Fl. Jan.–April.
Also in S. India.

13. **ALLÆANTHUS,** *Thw.*

Deciduous trees, juice milky; l. alt., penniveined; stip. lateral; fl. minute, diœcious, male densely crowded on one side of an axillary elongate, catkin-like, flexuous, peduncled receptacle, fem. crowded in globose, axillary, peduncled, pisiform heads, mixed with clavate bracteoles; male fl. globose, peri-

anth. 4-fid, lobes concave, imbricate; stam. 4, fil. inflexed in bud; pistillode minute; fem. fl.:—perianth tubular, unequally obtusely 4-lobed; ov. sessile, straight, style filiform, long, simple or with a short lateral arm, ovule pendulous; achenes in globose heads, oblique, enclosed in the perianth, style subterminal, pericarp coriaceous; seed subglobose, endosperm 0, cotyledons broad, crumpled, radicle ascending.—Sp. 2 or 3; 1 in *Fl. B. Ind.*

A. zeylanicus, *Thw. in Kew Journ. Bot.* vi. 303 (1854). **Alandu,** *S.*

Thw. Enum. 263. Bureau in DC. Prod. xvii. 223. C. P. 2215.
Fl. B. Ind. v. 490. Kew Journ. Bot. vi. t. 9 B. Bedd. Fl. Sylv. t. 305.

A tree 30–40 ft., branchlets terete, hairy; l. 3–4 in., distichous, lanceolate, acuminate, base cordate, serrate, sparsely hairy, veins 12–14 pairs; petiole ¼ in. pubescent; stip. obliquely oblong, mucronate, striate; male spikes (or recepts.) 1–2¼ in., pubescent, densely clothed with minute fl., except along a narrow canal-like passage; peduncle about ¼ in.; fem. heads ⅓ in. diam., compact, bracteoles crowned with broad warted green pubescent tops; tips of perianth lobes pubescent.

Moist region 1–2000 ft.; rather rare. Peradeniya, Maturata. Fl. Feb., August; yellowish.

Endemic.

The inner bark yields a very tough fibre.

14. PLECOSPERMUM, *Trécul.*

Trees or shrubs, spinous or not; l. alt., penniveined, entire; stip. minute; fl. diœcious, in globose axillary peduncled heads, male closely packed but distinct, bracteolate, fem. confluent by their fleshy perianths into a many-celled anthocarp; male fl.:—perianth 4-lobed, lobes imbricate, emarginate; stam. 4, fil. inflexed in bud; pistillode slender, pubescent; fem. fl.:—perianth 4-toothed; ov. straight, style filiform, undivided, ovule pendulous; fr. a globose fleshy anthocarp, enclosing a few globose immersed seeds, endosperm 0, cotyledons very unequal, the larger fleshy enclosing the folded smaller, radicle short, upcurved.—Sp. 3; 2 in *Fl. B. Ind.*

P. spinosum, *Tréc. in Ann. Sc. Nat. ser.* 3, viii. 124 (1847). **Katutimbol,** *S.*

Trophis spinosa, Heyne, Moon, Cat. 68. Thw. Enum. 263. C. P. 2212.
Fl. B. Ind. v. 491. Wight, Ic. t. 1963. Bedd. Fl. Sylv. t. anal. 26, f. 2.

A shrub or small glabrous tree, with stout axillary nearly straight spines; branchlets drooping, pubescent; l. rather distant, 2–3 in., oval-oblong or obovate, acute or obtuse, base subacute, hard shining, margins recurved, veins 4–6 pairs, slender; petiole $\frac{1}{6}$–$\frac{1}{3}$ in.; male heads $\frac{1}{3}$ in. diam., fl. minute, subsessile, pubescent, bracteoles minute, perianth lobes obtuse or notched; fem. heads larger, fruiting $\frac{1}{2}$ in. diam., lobed, pubescent.

Low country to 3000 ft. in both regions; rather common. Fl. Feb.–April; greenish.

Throughout India.

15. **FLEURYA,** *Gaudich.*

Annual herbs, with stinging hairs; l. alt., toothed, base 3-veined; stip. connate in pairs; fl. unisexual, in unisexual or androgynous spicate or cymose long-peduncled clusters; male fl.:—sep. 3–5, subvalvate or imbricate; stam. 3–5, fil. inflexed in bud; pistillode small; fem. fl.:—perianth 4- lobed or -partite, posticous lobe largest; ov. oblique, decurved, style subulate, upcurved, ovule erect; achene half enclosed in the persistent perianth, obliquely ovate, compressed, gibbous, pericarp membranous, endosperm scanty, cotyledons broad, radicle short, straight.—Sp. 10; 1 in *Fl. B. Ind.*

F. interrupta, *Gaud. in Freyc. Voy. Bot.* 497 (1826). **Wal-kahambiliya,** *S.*

Herm. Mus. 29. Burm. Thes. 231, 232. Fl. Zeyl. n. 336. *Urtica interrupta*, L. Sp. Pl. 985. *Boehmeria interrupta*, Willd., Moon, Cat. 62. Thw. Enum. 258. C. P. 2186.

Fl. B. Ind. v. 548. Burm. Thes. t. 110, f. 1 and 2. Wight, Ic. t. 1975.

Stem 2–4 ft., erect, flexuous, branched, furrowed; whole plant more or less covered sparsely with scattered stinging hairs; l. 1–6 in., broadly ovate, acuminate, coarsely crenate-serrate, membranous, base cuneate rounded or cordate, 3–5-veined, lateral veins 3–5 pairs; petiole long, very slender; cymes or spikes very variable with the ped. 2–10 in. long, bearing rather distant pedicelled clusters of small green fl.; fl. branches short, or long and very slender; male sep. concave; pistillode minute; fem. pedicel decurved, swollen above; achene cordate, compressed, keeled on one side, the keel decurrent on the pedicel.

Low country in waste or cultivated ground; common. Fl. Nov.; green.

S. India, E. Bengal, Burma, Malaya, China, Pacific Is., Abyssinia.

16. **LAPORTEA,** *Gaudich.*

Perennial herbs or shrubs, with (often very minute) stinging hairs; l. large, alt., penniveined; stip. opposite, free or connate; fl. unisexual, in axillary cymes; male fl.:—sep. 4–5, subvalvate; stam. 4–5, fil. inflexed in bud; pistillode short; fl. fem.:—sep. 3–4, free or connate, persistent; ov. compressed, style filiform, ovule erect or ascending; achene oblique, endosperm scanty or 0, cotyledons broad.—Sp. about 25; 3 in *Fl. B. Ind.*

Ped. of fem. fl. winged, achene deflexed . . . 1. L. TERMINALIS.
Ped. of fem. fl. cylindric, achene erect . . . 2. L. CRENULATA.

1. **L. terminalis,** *Wight*, Ic. vi. 9 (1853).
Thw. Enum. 259. *L. evittata*, Wedd. in DC. Prod. xvi. 1, 79. C. P. 3336.
Fl. B. Ind. v. 549. Wight, Ic. t. 1972.

Stem 2–4 ft., erect, herbaceous, glabrous or puberulous; whole plant covered more or less with spreading stinging hairs; l. 4–10, ovate-oblong, acuminate, coarsely toothed or serrate, membranous, base rounded or subcordate; petiole up to 2½ in. long, slender; stip. ½ in. long, or shorter; male cymes as long as the petioles or longer, fem. much larger, usually in the upper axils, with spreading branches; fl. monœcious, male shortly ped., sep. equal, pubescent; fem. fl. on broadly winged cuneiform peds., sep. very unequal, lateral much the largest, style slender; achene sharply deflexed, faces slightly tubercled.

Forests of montane zone 4–6000 ft.; rather rare. Hewaheta; Maturata. Fl. Jan.; green.
Also in Himalaya and Nilgiri Mts.
This nettle stings sharply, but the pain does not last very long.

2. **L. crenulata,** *Gaud. in Freyc. Voy. Bot.* 498 (1826). **Má-ussá,** *S.*
Urtica stimulans, Moon, Cat. 62 (? L. f.). Thw. Enum. 259. Wedd. l. c. 85. C. P. 2200.
Fl. B. Ind. v. 550. Wight, Ic. t. 686 (*Urtica crenulata*). Bedd. Fl. Sylv. t. 306.

Stem 8–10 ft., stout, shrubby; whole plant clothed more or less with very minute stinging hairs; l. 9–12 in., oval to oblong or oblong-lanceolate, acute, acuminate or caudate, entire or margins minutely sinuate or crenulate, base obtuse acute or notched, veins 12–16 pairs, petiole 1–4 in., stout; stip. small; cymes short, dichotomously branched; fl. diœ-

cious, shortly pedicelled, ped. cylindric; male fl.:—sep. equal, free; fem. fl.:—perianth minute, subcampanulate, lobes acute, style stout, villous to the base; achene erect, turgid, obliquely ovoid.

Damp forests 2–5000 ft.; common. Fl. Sept.–Jan.; green.
S. India, E. Bengal, Burma, Malaya.
The Fever- or Devil-nettle stings severely, often producing distressing effects that remain for many days.

17. GIRARDINIA, *Gaudich.*

Herbs or undershrubs with stinging hairs; l. alt., base 3-veined, entire or lobed; stip. connate, foliaceous; fl. monœcious, in simple or panicled cymes or heads; male fl.:—sep. 4–5, subequal, valvate; stam. 4–5, fil. inflexed in bud; pistillode short; fl. fem.:—perianth subcampanulate, 2–3-toothed, persistent; ov. erect, stigma subulate, ovule erect; achene flattened, endosperm scanty or 0, cotyledons broad.—Sp. 7; 1 in *Fl. B. Ind.*

G. heterophylla, *Dcne. in Jacquem. Voy. Bot.* 151 (1841). **Gas-kahambiliya,** *S.*

Herm. Mus. 47. Burm. Thes. 233 (in part). *Urtica heterophylla*, Vahl, Moon, Cat. 62. *G. zeylanica*, Dcne. l. c. 152; Wedd. in DC. l. c. 101; Thw. Enum. 259. C. P. 2193.
Fl. B. Ind. v. 550. Wight, Ic. t. 687 (*Urtica*).

A tall, robust, perennial-rooted herb, up to 6 ft. high, closely armed with long rigid stout or slender stinging hairs; stem and branches furrowed; l. 4–12 in. long and often as broad, cordate, the upper variously lobed, often palmately or pinnatifidly, coarsely toothed, more or less pubescent; petiole up to 7 in.; stip. 2-fid; cymes peduncled, male interrupted, subcylindric, fem. in the upper axils, bearing heads of fl. clothed with long stinging hairs; achene broadly ovate, or subcordate, black, punctate.

Var. β, **palmata.** *G. palmata*, Gaud. (Wedd. l. c. 101). *G. Leschenaultiana*, Dcne. l. c. 152; Thw. Enum. 259. Wight, Ic. t. 1976 (2 plates). C. P. 3520.

L. hirsute beneath, stip. broadly cordate.

Waste ground in low country to 3000 ft.; common. Var. β, forests of montane zone 3–6000 ft.; rather common. Fl. Feb.; green.
India, Burma, Java. Var. β on the Nilgiris.
This stings severely, especially var. β, known to planters as the 'elephant-maussa.' In S. India it is known as the 'Nilgiri Nettle,' and affords a very good fibre.

18. **PILEA,** *Lindl.*

Glabrous herbs; l. opposite, base 3-veined; stip. connate, sometimes obsolete; fl. minute, mono- or diœcious, in axillary dichotomous spreading cymes; male fl.:—sep. 2–4; stam. 2–4, fil. inflexed in bud; pistillode stout; fem. fl.:—sep. 3–4, minute, unequal, dorsal longest, each with a staminode at its base; ov. straight, stigma sessile, penicillate, ovule erect; achene compressed, endosperm scanty, cotyledons broad.—Sp. about 160; 20 in *Fl. B. Ind.*

Achene smooth, or nearly so.
  Cymes long-peduncled . . . . 1. P. WIGHTII.
  Cymes short-peduncled . . . . 2. P. STIPULOSA.
Achene granular . . . . 3. P. TRINERVIA.

1. **P. Wightii,** *Wedd. in Ann. Sc. Nat. ser.* 4, i. 186 (1854).
Thw. Enum. 259. Wedd. in DC. Prod. xvi. i, 125. C. P. 2185.
Fl. B. Ind. v. 554. Wight, Ic. t. 1974 (*P. radicans*).

Stem 1–2 ft., slender, creeping below; l. ¼–1 in., ovate to orbicular-ovate, coarsely serrate, membranous, flaccid; petiole about half as long as the blade; stip. small, triangular, or obsolete; cymes long-peduncled, androgynous, branches divaricate; male sep. 4, dorsally horned below the tip; fem. sep. very unequal, narrow, acuminate; achene ovoid, nearly straight.

Shady forests in montane zone 5–7000 ft.; very common. Fl. Sept.; green.
Himalaya Mts., Nilgiri Mts., Java.

2. **P. stipulosa,** *Miq. in Zoll. Syst. Verz.* 102 (1854).
Wedd. Monogr. Urt. 230. *P. angulata*, Bl., Thw. Enum. 259; Wedd. in DC. l. c. 131. C. P. 2184.
Fl. B. Ind. v. 555.

Stem 1–3 ft., stout, erect; l. glabrous or very sparsely hairy, 3–4 in. long, oval or ovate-oblong, acuminate, obtusely cuspidate or caudate, coarsely serrate or toothed, membranous, base cuneate or rounded; petiole as long as the blade or shorter; stip. large, oblong, green; fl. diœcious; male cymes ½–1 in.; fem. cymes binate, shorter than the petiole, sessile or shortly peduncled, branches short; fl. in confluent clusters, sessile; male sep. broadly ovate; fem. sep. subequal, orbicular; achene minute, smooth.

Woods and shady places in lower montane zone; common. Fl. October; green.
Also in Java.

3. **P. trinervia,** *Wight, Ic.* vi. 9 (1853).
Wedd. Monogr. Urt. 224. Thw. Enum. 259. Wedd. in DC. l. c. 131. C. P. 2093.
Fl. B. Ind. v. 557. Wight, Ic. t. 1973.

Stem 4–5 ft., robust, erect, succulent, internodes short, tumid, nodes constricted; l. 3–6 in., from broadly oval to oblong-lanceolate, acuminate or caudate, serrate, base acute or rounded, veins strong with parallel cross-venules; petioles of opp. l. unequal, of longer up to 3 in.; stip. short, triangular, caducous; fl. monœcious; male cymes large, subcorymbosely branched, ped. long or short, fl. scattered or clustered; fem. cymes usually 2-nate, shorter, slender; male sep. 4, equal, ovate, acuminate, shortly beaked dorsally below the tip, fem. sep. 3, dorsal larger than the others; achene ovoid, margins thickened, faces granular.

Moist region up to 5000 ft.; common in damp shady places. Fl. April–Sept.; green.
Also in S. India and (?) Java.

P. muscosa, Lindl. (*P. microphylla*, Liebm.), a small S. American species, is now a very common weed in the low country, and completely naturalised. It was introduced previously to 1860, but I do not know how much earlier. It is called the 'Gunpowder Plant.'

19. **LECANTHUS,** *Wedd.*

An annual herb; l. opp., 3-veined and penniveined, in unequal pairs; stip. scarious; fl. mono- or diœcious, crowded on solitary axillary peduncled bracteate peltate fleshy recepts.; male fl.:—sep. 4–5, subequal, dorsally horned below the tip; stam. 4–5, fil. inflexed in bud; pistillode conic; fem. fl.:—sep. 3, very minute, unequal; ov. straight, stigma sessile, penicillate, ovule erect; achene ovoid, compressed, endosperm fleshy, cotyledons ovate.—Monotypic.

L. Wightii, *Wedd. in Ann. Sc. Nat. ser.* 4, i. 187 (1854).
L. peduncularis, Wedd. in DC. Prod. xvi. 164. C. P. 3870.
Fl. B. Ind. v. 559. Wight, Ic. t. 1985 (*Elatostema ovatum*). Wedd. Monogr. Urt. t. 9, f. C.

An erect glabrous herb; stem 6–18 in., stout or slender, simple or branched from a decumbent base; l. 2–3 in. long, obliquely ovate, obtuse, acute or acuminate, coarsely toothed or serrate from below the middle upwards, membranous, glabrous or sparsely hairy; petiole of one leaf up to 2 in., of the opposite much shorter; stip. entire or toothed; recept. long- or short-peduncled, flat or turbinate, $\frac{1}{4}$–$\frac{3}{8}$ in. diam., green; fl. pedicelled, many of fem. imperfect; achene minute, smooth.

Montane zone; very rare. Found only in East Matale Dist. by Beckett. Fl. Feb.; green.

Himalaya, Nilgiris, and other mts. of India, Java, Trop. Africa.

20. **PELLIONIA,** *Gaudich.*

Succulent usually glabrous herbs; l. distichously sub-opposite, often in unequal pairs, one large, the other minute, unequal-sided, 3-veined; stip. persistent; fl. mono- or diœcious, in axillary, long-peduncled, contracted, dichotomously branched cymes; male fl.:—sep. 4 or 5, obtuse, imbricate, dorsally spurred below the tip; stam. 5, fil. inflexed in bud; pistillode conic; fem. fl.:—sessile in small axillary heads; sep. 4–5, subequal; staminodes inflexed; ov. oval, shorter than the sep., stigma sessile, penicillate, ovule erect; achene embraced by the sep., compressed, tubercled, endosperm very scanty, cotyledons rounded, radicle conic.—Sp. 15; 12 in *Fl. B. Ind.*

P. Heyneana, *Wedd. Monogr. Urt.* 287 (1857).
Thw. Enum, 259. Wedd. in DC. Prod. xvi. 169. C. P. 2179.
Fl. B. Ind. v. 561. Wedd. Monogr. Urt. t. 5.

A perennial herb; stem 6–10 in. high, woody, branched, sometimes creeping below, tips of branches hirsute; l. 4–8 in., with often opposite each a minute subalternating recurved leaflet, subsessile or shortly petioled, falcately oblong or oblong-lanceolate, obtusely acuminate or caudate, quite entire, base unequally cordate, thinly coriaceous, veins arched and midrib puberulous beneath; petiole stout, pubescent; stip. $\frac{1}{3}$–$\frac{1}{2}$ in., triangular, tip subulate, male cymes long-peduncled, dense- or lax-fld., ped. pubescent; fem. heads sessile.

Moist country 2–4000 ft.; rather rare. Kaduganawa; Hantane. Fl. May; male pink.

Also in S. India.

The female inflorescence is sessile not pedunculate in our plant.

21. **ELATOSTEMA,** *Forst.*

Herbs or undershrubs; l. alt., or subopp., with one of each pair minute, distichous, sessile or subsessile, unequal sided, base 3-veined, tissue with usually conspicuous cystoliths; stip. various; fl. very minute, crowded in an involucre or receptacle of free or confluent bracts, mixed with bracteoles; male fl.:—sep. 4–5, two or more dorsally gibbous or spurred; stam. 4–5, fil. inflexed in bud; pistillode minute; fem. fl.:—

sep. 3–5, very minute, persistent; staminodes minute or o; ov. erect, stigma penicillate, ovule erect; achene minute, endosperm o, cotyledons ovate.—Sp. about 50; 32 in *Fl. B. Ind.*

Small l. opp. the larger few or o.
  Cystoliths very minute or o.
    Tips of branches strigose . . . . . 1. E. WALKERÆ.
    Tips of branches glabrous . . . . . 2. E. ACUMINATUM.
  Cystoliths large, conspicuous . . . . . 3. E. LINEOLATUM.
Small l. opp. all the larger . . . . . 4. E. SURCULOSUM.

1. **E. Walkeræ,** *Hk. f. in Fl. B. Ind.* v. 566 (1888).
E. sessile, Thw. Enum. 427 (non Forst). C. P. 3767.
Fl. B. Ind. v. 566.

Stem 4–10 in., rather stout, flexuous, base woody, tips strigosely pubescent; l. 3-4 in., sessile or very shortly petioled, broadly obliquely oblong or cuneate-obovate, acutely caudate, coarsely crenate above the middle, base obliquely cordate, membranous, cystoliths minute, upper surface setose, with tuberous-based bristles, under with softer hairs, veins slender, 4–6 pairs; bracts of fem. recept. confluent in a fleshy recept. $\frac{1}{2}$–$\frac{3}{4}$ in. diam., closely appressed to the stem, margin membranous, crenate, ciliate; achene very shortly pedicelled, turgidly ellipsoid, ribbed.

Lower montane zone; very rare (?). Rhamboda, at 4000 ft. (Thwaites). Fl. (?)
Endemic.

The same locality in Ceylon is given for *E. sessile*, Forst, in Fl. B. Ind. v. 563, by an oversight.

2. **E. acuminatum,** *Brongn. in Duperr. Voy. Bot.* ii. 211 (1829).
Trim. Syst. Cat 85. Wedd. in DC. Prod. xvi. 181. C. P. 3970.
Fl. B. Ind. v. 566. Wedd. Mon. Urt. t. 9 D, f. 1–4.

Stem much branched, woody below, glabrous; branches divaricate; l. subsessile, 2–5 in. long, obliquely oblong-lanceolate or oblanceolate, caudate, coarsely crenate-toothed in upper third to two-thirds, membranous, base acute or subacute, cystoliths very minute, almost invisible; stip. subulate; fl. monœcious or diœcious; recepts. small or minute, bracteoles ovate; sep. 5, ovate, glabrous; bracteoles of fem. recepts. linear-spathulate, ciliate, sep. linear, as long as the ovoid achene.

Lower montane zone; very rare. Dolosbagie. Fl. May; green.
S. India, Khasia, Burma, Malaya.

3. **E. lineolatum,** *Wight, Ic.* vi. 11 (1853).
Wedd. Monogr. Urt. 312. Thw. Enum. 259. Wedd. in DC. l. c. 181. C. P. 2183.
Fl. B. Ind. v. 565. Wight, Ic. t. 1984.

Herbaceous or suffruticose, glabrous, pubescent or tomentose; stem simple or branched, branches often widely spreading; l. subsessile, 1-6 in., obliquely or falcately oval, oblong-lanceolate, or linear-oblong, acuminate, or broadly caudate, entire or coarsely crenate, toothed or serrate above the middle, base acute or cuneate, lateral veins very few; cystoliths crowded and conspicuous: stip. linear-lanceolate; fl. diœcious, recepts. of both sexes sessile, capitate, males pisiform, fem. smaller; bracts rounded, pubescent; bracteoles of male recept. oblong with pubescent costa and tips, of fem. spathulate, ciliate; male sep. rounded, obtuse, pubescent; fem. sep. minute, denticulate; achene ellipsoid, acute.

Var. β, **lineare,** *Wedd. Monogr. Urt.* 313. C. P. 3426.

Very slender, l. 2–4 in., linear, obtuse, quite entire or with 1–2 large teeth, veins very obscure.

Var. γ, **bidentatum,** *Hk. f. l. c.* C. P. 456.

Slender, much branched, l. ¾–1½ in., lower half cuneately obovate, upper as long, ligulate, obtuse, with two large teeth or 3–4 rounded ones about the middle, branches often bearing much smaller accessory l.

Var. δ, **falcigerum,** *Wedd. l. c.* C. P. 3427.

Very slender and much branched, l. 2–5 in., narrow, falcately linear-lanceolate, entire, or with 1–2 large marginal teeth.

Var. ε, **petiolare,** *Thw. ex Trim. in Journ. Bot.* xxiii. 243. C. P. 3920.

L. 5 in., linear-lanceolate, narrowed into a petiole ½–¾ in. long, with 3–5 large teeth on each margin, and a caudate tip 1 in. long, cystoliths copious beneath, visible above only on the margin and along the midrib.

Damp forests up to 5000 ft.; common, especially in lower montane zone. Fl. March–May; green.

Himalaya Mt. and South to Travancore.

Exceedingly variable in habit and foliage; none of our forms are precisely like Wight's figure, but C. P. 2183, called var. *major* by Weddell, is nearest. Thwaites considered var. *bidentata* as the type of the species.

Var. ε ought probably to be reckoned a separate species, but I have too little material, and the only locality is 'Central Province.'

4. **E. surculosum,** *Wight, Ic.* vi. 35 (1853).

Wedd. Monogr. Urt. 329. Thw. Enum. 260. *E. diversifolium*, Wedd. in DC. l. c. 189. C. P. 2181.

Fl. B. Ind. v. 572. Wight Ic. t. 2091, f. 4.

Stems 3–12 in., tufted, erect from a rooting, stoloniferous base, or prostrate, stout and fleshy or slender, glabrous or

pubescent; l. $1\frac{1}{2}$–3 in., uniformly increasing in size upwards, orbicular to oblong, obtuse to caudate-acuminate, entire crenate serrate or pinnatifid, each with a small subopposite usually deflexed leaflet, membranous coriaceous or almost fleshy, sometimes imbricating upwards and the small ones downwards, veins few, faint, base obtuse acute or subauricled on one side, cystoliths numerous; stip. minute, ovate; male recepts. $\frac{1}{3}$–$\frac{1}{2}$ in. diam., ped. longer or shorter than the l., rarely 0; bracts free, broad, membranous, outer often dorsally spurred; bracteoles linear, tips hairy; male fl. few, sep. 4, ovate; fem. recept. smaller, bracteoles linear-spathulate, ciliate, sep. 3, minute, ovate; achene narrow, ribbed.

Var. β, **rigidiusculum,** *Thw. ex Hk. f. in Fl. B. Ind.* C. P. 2182.

Glabrous, stem 4–8 in., l. $\frac{1}{2}$ in., many, uniform, cuneately oblong or lanceolate, obtusely crenate or serrate towards the tip, base acute, recepts. minute, 2–3-fid., male sessile, bracts few, acute.

Wet rocks and banks in shady places in montane zone to 6000 ft.; common. Var. β, Adam's Peak. Fl. Sept. Oct.; yellow-green.
Himalaya, Khasia, and Nilgiri Mts.

22. **PROCRIS,** *Juss.*

Succulent herbs or undershrubs, often epiphytic; l. distichous, alt., usually of two forms, the larger on one side of the stem, oblique, penniveined, with a much smaller bract-like on the opp. side, cystoliths minute; stip. axillary; fl. mono- or diœcious, males solitary, in ebracteate clusters, fem. sessile, densely crowded in ebracteate minute peduncled heads; male fl.:—sep. 5, obovate; stam. 5, fil. inflexed in bud; pistillode globose; fem. fl. very minute, perianth short, cupular; ov. ovoid, stigma penicillate, ovule erect; achene ovoid or oval, striolate, endosperm scanty or 0, cotyledons oval.—Sp. 8 or 9; 2 in *Fl. B. Ind.*

P. lævigata, *Bl. Bijd.* 508 (1825).
Thw. Enum. 260. Wedd. in DC. Prod. xvi. 192. C. P. 2180.
Fl. B. Ind. v. 575. Hook, Ic. Pl. t. 1295.

A glabrous succulent suffruticose epiphyte, 2–5 ft. high; stem as thick as the thumb below; larger l. 6–10 in., obliquely oblanceolate, acuminate or subcordate, entire or crenate-serrate above the middle, base narrowed into a short petiole, veins 5–8 pairs, very oblique, small l. if present $\frac{1}{4}$ in., ovate, reflexed; stip. small, triangular; infl. on the

naked branches; male in fascicles about $\frac{1}{4}$ in. diam., pedicel $\frac{1}{10}$ in.; fem. in minute fascicled peduncled heads $\frac{1}{10}$–$\frac{1}{6}$ in. diam., ped. $\frac{1}{16}$–$\frac{1}{12}$ in.; achene minute, ovoid, slightly compressed, base seated on the very short cupular perianth.

Damp places on rocks and tree-trunks, epiphytic in forests of the montane zone 3–6000 ft.; rather common. Fl. (?); green.

Mountains of India, Java, Borneo, Trop. Africa.

The figure of the plant above quoted, being made from a dried specimen, does not give the succulent habit.

23. BOEHMERIA, *Jacq.*

Pubescent shrubs or small trees; l. opp. or alt., petioled, base 3-veined, crenate or serrate; stip. deciduous; fl. monoecious or dioecious, in unisexual axillary spiked racemed or panicled clusters; male fl.:—sep. 3–5, free or connate, valvate; stam. 3, fil. inflexed in bud; pistillode subglobose; fem. fl.:—perianth tubular, compressed, 3–4-toothed, persistent; ov. included in the perianth, sessile or stipitate, stigma filiform, persistent, ovule erect; achene crustaceous, enclosed in the marcescent perianth, endosperm copious or scanty, cotyledons broad.—Sp. about 45; 10 in *Fl. B. Ind.*

Fl. in axillary clusters . . . . . . 1. B. MALABARICA.
Fl. in axillary spikes . . . . . . 2. B. PLATYPHYLLA.

B. malabarica, *Wedd. Mon. Urt.* 355 (1857). **Maha-diya-dul,** *S.*

Urtica aquatica, Moon, Cat. 62. Thw. Enum. 260. Wedd. in DC. Prod. xvi. II. 203. C. P. 2198.

Fl. B. Ind. v. 575. Bedd. Fl. Sylv. t. anal. 27, f. 2 (*B. ramiflora*).

An erect shrub of 2–4 ft., or small tree, up to 20 ft. high; stems or branches terete, smooth, pubescent or puberulous; l. subequal or alternately large and small, the large 4–8 in., ovate oblong or oval, acuminate or caudate, with the tip serrate, crenulate or serrulate except towards the rounded or cordate base, membranous, glabrous and sometimes tessellately rugose above, pubescent or tomentose beneath, lateral veins 2–3 pairs, basal long, strong; petiole $\frac{1}{4}$–3 inch.; fl. monoecious, minute, in small axillary sessile clusters; achene ovoid, closely invested by the broadly oval truncate puberulous perianth.

Moist region to 4000 ft.; rather rare (?). Kandy; East Matale. Fl. May.

S. India, E. Bengal, Burma, Java.

The bark yields an exeellent fibre, used for making fishing lines.

2. **B. platyphylla,** *Don, Fl. Nep. Prod.* 60 (1825).
Wedd. Mon. Urt. 364. Thw. Enum. 260. Wedd. in DC. l. c. 210. C. P. 2196, 2952.
Fl. B. Ind. v. 578. Wight, Ic. t, 1977 (*Splitgerbera macrostachya*).

A shrub with soft glabrous or strigose branches; l. 3–9 by 2½–6 in., mostly opp., broadly ovate oval or orbicular, acuminate or caudate, with the tip serrate, coarsely toothed, nearly glabrous or pubescent on both surfaces, or smooth or tessellately reticulate on the upper, base rounded or cordate, veins 3–5 pairs, the basal long; petiole 1–5 in.; stip. triangular-lanceolate; fl. in minute subremote pisiform clusters on long (up to 18 in.), on short slender flexuous androgynous or unisexual spikes; male or androg. spikes simple or branched, fem. simple; male sep. 4, ovate, acuminate, pubescent; fem. perianth usually with a very small unequally 4-toothed mouth; achene crustaceous, shining, enclosed in a turgid gibbous compressed stipitate pubescent perianth.

Moist region 2–6000 ft.; common. Fl. April, October.
Hills of India, Burma, Malay Is., China, Japan, Africa.
'A very variable plant, and many mere varieties have been distinguished by name. Of these, var. *scabrella* (Wight, Ic. t. 691), *rugosissima*, *rotundifolia*, and *longissima* are recorded for Ceylon, but their differences do not appear to me to be worth varietal distinction.'—*Trimen.* [Weddell distinguishes 20 varieties, of which 5 are found in Ceylon, namely: *macrostachya*, with l. serrate almost throughout, and very long pendulous fem. spikes; *zeylanica* (C. P. 2197), with narrower l. and short simple erecto-patent spikes; *scabrella*, with small broad cuspidate acutely toothed l., and short subsimple erect spikes; *rugosissima*, with large broad rugose l., and short subfascicled spikes; *rotundifolia*, with broad cuspidately caudate coarsely toothed membranous l., and short spikes. I have also, in Fl. B. Ind., distinguished a var. *longissima*, with l. ovate or ovate-oblong, glabrous, long-petioled, coarsely toothed, and very long and slender spikes. The specimen is from Col. Walker, and the same form occurs in the Pulney and Nilgiri Mts.—J. D. H.]

24. CHAMABAINIA, *Wight.*

A slender, diffuse herb; l. opp., petioled, membranous, base 3-veined, toothed; stip. in pairs, orbicular, scarious, enclosing the young infl.; fl. in axillary bracteate clusters, male peduncled; perianth 4-lobed, lobes valvate; stam. 4, fil. incurved in bud; pistillode clavellate; fem. fl. subsessile, perianth tubular, compressed, mouth 5-toothed; ov. ovoid, stigma sessile, fimbriate; achene ovate, compressed, acute, smooth.—Monotypic.

C. cuspidata, *Wight, Ic.* vi. 11 (1853).
Thw. Enum. 260. *C. squamigera*, Wedd. in DC. l. c. 218. C. P. 2882.
Fl. B. Ind. v. 580. Wight, Ic. t. 1981.

Stems rooting and ascending, more or less pubescent; l. ½–2 in., ovate, acute, sparsely hairy, base rounded or cuneate, veins 2–3 pairs above the basal; petiole ⅙–½ in., slender; stip. 4 at each node, brown when dry; male fl. in upper axils, sep. mucronate, hairy; fem. in dense clusters; bracteoles small, lanceolate; perianth hirsute.

Upper montane zone above 6000 ft.; rare. Nuwara Eliya (Ferguson); summit of Pedurutalagala. Fl. December; greenish.

Himalaya, Khasia, and Nilgiri Mts.

This plant is found at actually the highest possible elevation in Ceylon, growing abundantly among the stones of the Trigonometrical Mound on the top of Pedurutalagala.

25. POUZOLZIA, *Gaudich.*

Erect or prostrate herbs, or undershrubs; l. alt., quite entire, 3-veined at the base, dotted with cistoliths; stip. free; fl. monœcious, in axillary bracteate often androgynous clusters or terminal spikes, small, green; male fl.:—sep. 3–5, ovate, acuminate, valvate; stam. 3–5, fil. inflexed in bud; pistillode various; fem. fl.:—perianth tubular, persistent, including the ov., ovule erect, stigma filiform, articulate on the achene which is ovoid, closely embraced by the coriaceous ribbed or winged perianth, pericarp crustaceous, shining.—Sp. about 50; 13 in *Fl. B. Ind.*

Sep. of male fl. dorsally rounded.
  Stamens 4 . . . . 1. P. INDICA.
  Stamens 5 . . . . 2. P. AURICULATA.
Sep. of male fl. sharply inflexed above the middle.
  Fl. in a terminal bracteate spike . . . . 3. P. WALKERIANA.
  Fl. in axillary clusters or cymes.
    Stam. 5 . . . . 4. P. BENNETTIANA.
    Stam. 1–3 . . . . 5. P. PARVIFOLIA.

1. **P. indica,** *Gaud. in Freyc. Voy. Bot.* 503 (1826).

Parietaria indica, L., Moon, Cat. 72. Thw. Enum. 260. Wedd. in DC. Prod. xvi. I. 220. *P. procumbens*, Wight, Ic. vi. 42. C. P. 2188.

Fl. B. Ind. v. 581. Wight, Ic. t. 1980, f. 1; t. 2100, f. 40; t. 2099, f. 35 (*P. procumbens*).

A perennial-rooted herb, very variable in size and habit, glabrous, hoary, pubescent or hirsute; stem erect or prostrate, 6–24 in. long, stout or slender; l. ½–3 in., opp. or alt., ovate to lanceolate, obtuse acute or acuminate, quite entire, base acute or rounded, veins usually only one pair above the basal; petiole ⅛–1 in.; stip. ovate, acuminate, ciliate; fl. in small axillary androgynous clusters, strigose with simple or hooked hairs; male fl.:—sep. 4, acute; stam. 4; fr. perianth ventricose, ribbed; achene ovoid, shining.

Var. β, **alienata,** Wedd. Mon. Urt. 399. Herm. Mus. 30. Fl. Zeyl. n. 371. *Parietaria zeylanica,* L. Sp. Pl. 1052 (non Mant.). *Urtica alienata,* L. Syst. Nat. ed. 12, 622. *Pouzolzia zeylanica,* Benn., Pl. Jav. Rar. 67. Wight, Ic. t. 693 (bad), and t. 2101, f. 45. C. P. 2189.

L. mostly opp., ovate, base rounded, lateral ribs of fr. perianth dilated into coriaceous wings or auricles.

Moist region up to 4000 ft.; common. Fl. all the year; reddish.
India, Burma, Malaya, China.

2. **P. auriculata,** *Wight, Ic.* vi. 10 (1853).
Thw. Enum. 260. Wedd. in DC. l. c. 225. C. P. 2191.
Fl. B. Ind. v. 582. Wight, Ic. t. 1980, f. 2.

Stem 1–2 ft., stout or slender, erect, hoary, pubescent or tomentose; l. 1–5 in., alt., oval ovate or lanceolate, acute or acuminate, quite entire, base usually acute 3-veined or 3-pli-veined, hispidulous above, more tomentose beneath, veins one or more pairs above the basal; petiole 1–3 in.; stip. ovate, acuminate; fl. in small axillary clusters; stam. 5; fr. perianth variously ribbed, one or more of the ribs sometimes dilated into wings or auricles, top short or produced into a longer or shorter bifid beak.

Var. β, **bicuspidata.** *P. bicuspidata,* Wight, Ic. vi. 42, t. 2098, f. 33. C. P. 4001.

L. narrowly ovate-lanceolate, fr. perianth ovoid, not winged, beak bifid, the lobes spreading.

Low country, principally in dry region; common. Fl. April, November.
Also in Peninsular India.

3. **P. Walkeriana,** *Wight, Ic.* vi. 41 (1853).
Memorialis aquatica, Wedd. Mon. Urt. 418. *Hyrtanandra Walkeriana,* Thw. Enum. 261. *P. glabra,* Wight, Ic. vi. 41. C. P. 2192, 3372.
Fl. B. Ind. v. 583 (*P. pentandra,* var.). Wight, Ic. t. 2095, ff. 15, 16.

A tall erect glabrous perennial-rooted herb, 2–3 ft. high, terminating in the long spike of bracteate clusters of fl.; l. opp., 3–7 in., lanceolate or ovate-lanceolate, acuminate, quite entire, smooth or scaberulous above, base acute or rounded, margins ciliolate or not, veins 0 but the basal pair, which run to the tip of the l.; petiole $\frac{1}{8}$–$\frac{1}{4}$ in.; stip. small, broadly ovate; fl. clustered in the bracts of an erect or nodding terminal spike up to 18 in. long; bracts gradually smaller upwards, ovate, acuminate or cuspidate, sessile or petioled, much exceeding the fl. clusters; fr. perianth with two broad lateral membranous wings, forming an almost orbicular fr., bilobed at base and apex.

Low country in rocky places of the moist and intermediate region up to 2000 ft.; rather common. Fl. Jan., Feb.
Endemic.

In a note on this plant, Dr. Trimen writes: 'This seems fairly distinct from *P. pentandra*, Benn., of India and Java, with which it is combined in Fl. B. Ind., but it may be an insular form only.' In this work I defer to his opinion, though on a re-examination of the specimens in the Peradeniya Herbarium I find no ground for altering my own, namely, that it is only a well-marked variety, distinguished by the larger longer-petioled l. acute at the base.

4. **P. Bennettiana,*** *Wight, Ic.* vi. 10 and 40 (1853).
Memorialis hispida, Wedd. Mon. Urt. 426. *Hyrtanandra hirta*, Thw. Enum. 261 (non Miq.). *Memorialis hirta*, Wedd. in DC. l. c. 235[6]. C. P. 2190.
Fl. B. Ind. v. 583. Wight, Ic. t. 1978.

Stems 2–3 ft., erect or prostrate, herbaceous or shrubby, glabrous or pubescent; l. 5–6 in., opp. or ternately whorled, shortly petioled, not passing into the bracts, oval or oblong to narrowly lanceolate, acuminate or caudate, quite entire, base cuneate, more or less pubescent on both surfaces, veins 0 but the basal pair, which run to the tip of the l.; stip. persistent; fl. in dense axillary cymose clusters; male sep. with a transversed dorsal ridge at the flexure, tip acuminate; stam. 5; fr. perianth costate or with 2–4 membranous reticulate wings.

Var. β, **Gardneri,** *Wedd. Mon. Urt.* 427. *P. Gardneriana*, Wight, Ic. vi. 39, t. 2092, f. 5. C. P. 2195.

L. $\frac{1}{3}$–$2\frac{1}{2}$ in., oblong, acuminate, base rounded truncate or subcordate, rarely acuminate.

Montane zone 4–7000 ft.; rather rare. Ramboda; Hunasgiriya Peak. Var β, Maturata; Haputale; Ramboda. Fl. April, Aug.–Oct.
Also in the hills of S. India.

5. **P. parvifolia,** *Wight, Ic.* vi. 39 (1853).
Hyrtanandra triandra, Miq., Thw. Enum. 261. *Memorialis parvifolia*, Wedd. in DC. l. c. 235[9]. C. P. 2187.
Fl. B. Ind. v. 587. Wight, Ic. t. 2092, f. 1.

Stems 6–12 in., spreading diffusely from the root, very slender, prostrate, pubescent or hirsute; l. opp., $\frac{1}{4}$–$\frac{1}{2}$ in., subsessile, oval or ovate, acute or acuminate, quite entire, 3-veined from the rounded or cordate base, strigosely hairy on both surfaces, veins 0 but the basal pair which run to the tip of the l.; petiole $\frac{1}{20}$ in.; stip. broadly ovate, persistent; fl. minute, solitary, or few, clustered in the axils; male sep. usually 3, pubescent at the flexure; stam. 3; fr. perianth minute, ovoid, acuminate, 4–5-ribbed, not winged.

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* Commemorates J. J. Bennett, F.R.S, Secretary of the Linnean Society, 1840–1860, and Keeper of the Botanical Department, British Museum, 1858–1870, who wrote a monograph of this genus in Plant Javan. Rar. Died 1876.

Patanas in upper montane zone above 6000 ft. Nuwara Eliya; Kandapolla. Fl. Feb.
Also in Java.

26. **VILLEBRUNEA,** *Gaudich.*

Trees or bushes; l. alt., petioled, penniveined, basal pair very short; stip. 2-fid.; fl. minute, diœcious, in axillary and rameal clusters of cymules; male fl.:—sep. 4, valvate; stam. 4, fil. incurved in bud; pistillode clavate; fem. fl:—base surrounded with fleshy bracts, perianth tubular, ventricose, adnate to the ov., mouth minute, 4–5-toothed; ov. firmly attached to the walls of perianth, stigma sessile, plumose; fr. perianth ventricose, furrowed, seated in a fleshy cup of confluent bracts, endocarp crustaceous.—Sp. about 8; 2 in *Fl. B. Ind.*

V. integrifolia, *Gaud. in Bot. Voy. Bonite*, t. 91 (1844), var. **sylvatica,** *Hk. f. in Fl. B. Ind.* v. 590.
Oreocnide sylvatica, Miq., Thw. Enum. 261. *V. sylvatica*, Bl., Wedd. in DC. l. c. 235[21]. C. P. 2199.
Fl. B. Ind. v. 590. Bl. Mus. Bot. ii. t. 15. Bedd. Fl. Sylv. t. anal. 26, f. 4.

An evergreen tree, 18–25 ft.; branchlets pubescent; l. 4–6 in., oval, oblong or obovate-oblong or oblong-lanceolate, caudate-acuminate, subfalcate, entire or crenulate above the middle, base obtuse or acute, membranous, penniveined, glabrous above, pubescent on the veins beneath, veins 5–8 pairs, very obliquely ascending; petiole $\frac{1}{2}$–1 in.; stip. lanceolate; fl. minute, sessile in crowded forked axillary cymules $\frac{1}{6}$–$\frac{1}{2}$ in. long, hispidulous.

Moist region 2–5000 ft.; rather common. Hantane; Alagalla; Nitre Cave Dist.; Haputale. Fl. Jan. and September.
S. India, E. Bengal, Andaman and Nicobar Is., Burma, Malay Is.

27. **DEBREGEASIA,** *Gaudich.*

Trees or shrubs; l. alt., serrate, ashy-white beneath, base 3-veined; stip. bifid; fl. monœcious or diœcious, fascicled in axillary pedicelled bracteolate cymes or heads, branches of cymes divaricate; male fl.:—sep. 3–5, valvate; stam. 3–5, fil. inflexed in bud; pistillode oblong, base woolly; fem. fl. densely crowded in at length fleshy heads; perianth tubular, ventricose, mouth minute, 4-toothed; ov. adnate to the base of and included within the perianth, stigma sessile, penicillate; fr. a pissiform head of more or less fleshy obovoid perianths and contained achenes.

L. linear- or oblong-lanceolate . . . . . . 2. D. VELUTINA.
L. orbicular, cuspidate . . . . 2. D. ZEYLANICA.

1. **D. velutina,** *Gaud. in Bot. Voy. Bonite*, t. 90 (1844–6). **Gas-dul,** *S.*

Urtica verrucosa, Moon, Cat. 62. *Morocarpus longifolius*, Bl., Thw. Enum. 261. *D. longifolia*, Wedd. in DC. l. c. 235[24]. C. P. 2194.

Fl. B. Ind. v. 590. Wight, Ic. t. 1959 (*Conocephalus niveus*).

A tall shrub or small tree; branches and petioles pubescent or tomentose; l. 4–7 in., oblong or linear-lanceolate, finely acuminate, serrulate, rugulose, base cuneate or rounded, upper surface rugose smooth or scabrid, under white- or ashy-pubescent, finely reticulate, pitted between the venules, veins 3 from the apex of the petiole, very long, and 2–3 pairs from the midrib above; petiole $\frac{1}{2}$–1 in.; heads of fr. $\frac{1}{3}$ in. diam., in shortly ped. dichotomous cymes, with divaricate branches; fr. perianth stipitate, obovoid or pyriform.

Low country in moist region up to 3000 ft.; common. Fl. March, April. Fr. bright orange-yellow.

S. India, E. Bengal, Burma, Java.

The bark gives a strong fibre, much like that of Rhea (*Boehmeria nivea*); and this is often called 'Wild Rhea' here.

2. **D. zeylanica,** *Hk. f. in Fl. B. Ind.* v. 592 (1888).

D. Wallichiana, Wedd. Mon. Urt. 464 (part). *Morocarpus Wallichianus*, Thw. Enum. 262. C. P. 2201.

Fl. B. Ind. v. 592.

A small tree, 15–20 ft., with stout pubescent branchlets as thick as the little finger; l. orbicular, 3–4 in. diam., cuspidate, quite entire, base rounded or cordate, glabrous above, softly white tomentose beneath, veins 3–4 pairs above the long basal pair which are strongly penniveined towards the margin of the l.; petiole 2–4 in., subfurfuraceously pubescent; heads of fr. $\frac{1}{2}$ in. diam., on stoutly peduncled dichotomously branched cymes.

Moist region in the low country to 2000 ft.; rather rare. Kukulkorale; Ambagamuwa; Hantane. Fl. March, April.

Endemic.

A handsome plant; the inflorescence orange, and the under surface of the large leaves snow-white.

Dr. Trimen follows me in keeping this distinct from the Khasia and Burma *D. Wallichiana*, but observes that 'the characters separating the two are but trifling.' These characters are: the orbicular leaves, shorter stouter petioles and peduncles, and much larger fruiting heads of the Ceylon plant.

Parietaria reclinata, Moon, Cat. Pl. Ceyl. 72, is not taken up in any more recent work. The widely distributed (in the old and new worlds) *P. debilis*, Forst., which occurs in the Nilgiri Mts. and elsewhere in India has not been collected in Ceylon.

Casuarina equisetifolia, Forst., *Kasa*, S. *Chavukku*, T. This is a native of Burma, Malaya, Australia, and Pacific Is., but does not occur wild in India or Ceylon. It, however, is a very commonly planted tree in all parts of Ceylon, and affords a very hard, fibrous, strong, brownish-red timber.

There are no representatives of the Orders *Cupuliferæ* or *Salicineæ* in Ceylon. No fewer than 72 species of Oaks (*Quercus* and *Castanopsis*) are included in the Fl. B. Ind., of which not one occurs in the Deccan Peninsula, though many do in the Malayan.

CXXII.—CERATOPHYLLACEÆ.

SUBMERGED fresh-water herbs; stem very slender, much branched, fragile; l. whorled, dichotomously cleft into filiform denticulate segments; fl. monœcious, axillary, minute, solitary; male fl.:—sep. 6–12, narrow, subvalvate in bud, 2-fid; stam. 10–20, fil. very short, anth. oblong, 2-celled, valves opening outward, connective produced into 2 cusps; fem. fl.:—sep. of male; ov. sessile, ovoid, 1-celled, style subulate, sometimes with a short basal arm, ovule solitary, pendulous, orthotropous; fr. a small coriaceous oval or ovoid compressed achene, tipped by a long or short style, and with 1 or 2 recurved spines on each side above the base; seed without endosperm, cotyledons thick, radicle very short, inferior, plumule many-leaved.

An Order of doubtful affinity; peculiar in Natal, with the many-leaved plumule of *Nelumbium*. The numerous described species may prove to be all forms of one or two widely distributed water-plants.

CERATOPHYLLUM, *L.*

For characters, see Order:—Sp. 2; 1 in *Fl. B. Ind.*

C. verticillatum, *Roxb. Fl. Ind.* iii. 624 (1832).
Thw. Enum. 290. C. P. 2311.
Fl. B. Ind. v. 639. Wight, Ic. t. 1948, f. 3, l. c. (*tuberculatum*).

Whole plant 8 in.–3 ft. long, forming an excessively branched tangle of slender branches and leaves that collapse in a tassel when taken out of the water; l. about 1 in. long, segments spreading in water, variable in thickness and amount of toothing; fl. about $\frac{1}{8}$ in. long, male with 2-fid. sep. shorter than the bicuspidate anthers; fr. oval, not winged, compressed, free, muriculate, tipped with the long spiniform style, and with a deflexed rigid spine as long as the style from each margin towards the base.

Submerged in water in tanks, lakes, and ponds in the low country; common, especially in the dry region.

Throughout the Eastern Tropics.

'Sir J. Hooker is probably correct in referring this to the cosmopolitan species *C. demersum*, L. Our Ceylon form is that figured in Wight, Ic. 1948, f. 3, as *C. tuberculatum*, Cham.'—*Trimen.*

We have no species of *Gnetaceæ* nor any *Coniferæ* in Ceylon. Of the latter Order a single species, *Podocarpus latifolia*, Wall., occurs in the hills of S. India, but the Peninsula is otherwise devoid of Conifers.

CXXIII.—CYCADEÆ.

Low trees with a (usually unbranched) cylindric trunk, clothed with the compacted woody bases of petioles; l. in a terminal crown, of two kinds, simple short sessile subulate woolly prophylla, and long petioled pinnate true leaves with alternate pinnules, involute in vernation; infl. diœcious; male a peduncled, erect, woolly cone, consisting of a short axis, clothed with closely imbricate cuneiform scales, each scale bearing on its under surface groups of 3–5 globose anthers; fem. infl. a whorl of long spreading woolly open carpels (carpophylls), bearing on marginal notches one or a few naked orthotropous ovules; seeds large, globose or oblong, testa thinly fleshy, crustaceous within; endosperm copious, fleshy and farinaceous; embryo small, axile.

I may remind the reader, that in accordance with Dr. Trimen's procedure in this work, the above ordinal description is restricted to the characters of the Ceylon genus. For the understanding of the peculiarities of the *Cycadeæ*, which belong to a different class of plants from Monocotyledons and Dicotyledons, the ordinary botanical text-books must be consulted.

CYCAS, *L.*

For characters, see Order.—Sp. 12; 5 in *Fl. B. Ind.*

Scales of male cone tapering into a long spine . . 1. C. CIRCINALIS.
Scales of male cone shortly acuminate . . . 2. C. RUMPHII.

1. **C. circinalis,** *L. Sp. Pl.* 1188 (1753). **Madu,** *S.*

Fl. Zeyl. n. 393. Moon, Cat. 70. Thw. Enum. 294. C. P. 3689.

Fl. B. Ind. v. 656. Rheede, Hort. Mal. iii. tt. 13–21. Bot. Mag. tt. 2826, 7.

Stem attaining 15 ft., simple or forked, glabrous, brown; prophylla 2–3 in. long; l. 5–9 ft.; petiole 18–24 in., with short deflexed spines near the base; lflts. 10–12 in., by about ½ in. wide, linear-lanceolate, acuminate, subfalcate, midrib stout beneath, bright green, glabrous; male cone 1–2 ft., shortly

peduncled, cylindric-ovoid; scales $1\frac{1}{2}$–2 in. long, deltoidly obovate, tip contracted into an upcurved spine an inch long, red brown; carpophylls about 1 ft. long, and $1–1\frac{1}{2}$ wide, narrowed into a long stalk, clothed with buff tomentum, crenate or spinous-serrate, bearing 3–5 pairs of ovules above the middle; seeds as large as a pigeon's egg, pale reddish-yellow.

Forests of moist region up to 1500 ft.; common. Fl. (?). Fr. orange-red.

Also in S. India, Sumatra, Java, Madagascar, E. Trop. Africa.

The stems are frequently bifurcated or branched. A clear gum exudes from the stems, and flour is obtained from the seeds. Linnæus gives this as a cultivated plant only in Ceylon.

2*. **C. Rumphii,** *Miq. in Bull. Sc. Phys. et Nat. Néerl.* i. 45 (1839). **Maha-madu,** *S.*

A. DC. in DC. Prod. xvi. II. 527. C. P. 3862.

Fl. B. Ind. v. 657 (not given for Ceylon). Rumph. Herb. Amb. i. tt. 22, 23.

Habit of *C. circinalis*, but taller, reaching 20 ft. and more; l. shorter, with fewer leaflets; scales of male cone thickened and obliquely truncate at the tip, with a short upcurved sometimes caducous point; carpophylls a foot long, narrower than in *C. circinalis*, with an entire often elongate subulate tip; seeds oval or subglobose, $2–2\frac{3}{4}$ in. long by $1\frac{1}{2}–1\frac{3}{4}$ in. diam.

Moist region below 1000 ft.; very rare and doubtfully native. Near Galle, 1853 (Ferguson); near Hewesse, Pasdun Korale (Thwaites). Fl. (?).

Burma, Andaman and Nicobar Is., Malaya, New Guinea, N. Australia.

This is probably not indigenous; it is much grown in Colombo gardens, but I have never seen a male plant there,* nor have I been able to obtain one from Peradeniya, where there are many female plants.

CXXIV.—HYDROCHARIDEÆ.

Fresh or salt-water herbs, with undivided submerged or floating leaves; fl. bisexual, monœcious or diœcious, enclosed in one or more spathes; sep. 3, green or petaloid, valvate or induplicate in bud; pet. 3 or 0; stam. 3–15, anth. erect; ov. inferior, 1-celled, or partially 3-celled by projecting parietal placentas; styles or style-arms 3–12, ovules numerous, parietal, pendulous, anatropous or orthotropous; fr. membranous or fleshy, often beaked; seeds few or many, endosperm 0, embryo various.

* Ferguson sent male fl. to Thwaites in 1865.

Fresh-water plants.
Stem branching, leafy.
L. whorled . . . . 1. HYDRILLA.
L. scattered . . . . 2. LAGAROSIPHON.
Stem very short or 0.
Style short, stigmas 3 . . . . . . 3. BLYXA.
Styles 6, 2-fid . . . . 4. OTTELIA.
Salt-water plants.
Stamens 3.
Styles 6–12 . . . . 5. ENHALUS.
Styles 3 . . . . 6. HALOPHILA.
Stamens 6 . . . . 7. THALASSIA.

1. **HYDRILLA,** *Rich.*

A submerged fresh-water herb ; l. 3–4-nately whorled ; fl. minute, diœcious, male solitary in a subglobose sessile spathe; sep. 3, green ; pet. 3 ; stam. 3, anth. reniform ; pistillode small ; fem. fl. 1 or 2, sessile in a tubular 2-toothed spathe ; sep. 3 ; pet. 3 ; ov. with a long filiform beak, styles 2–3, linear, stigmas fimbriate ; fr. subulate, 2–3-seeded ; seeds very minute, oblong, testa produced at both ends.—Monotypic.

H. ovalifolia, *Rich. in Mem. Inst. Fr.* ii. 76 (1811).
Serpicula verticillata, L. f., Moon, Cat. 62. *H. verticillata*, Casp.; Thw. Enum. 331. C. P. 2310.
Fl. B. Ind. v. 659 (*H. verticillata*). Roxb. Cor. Pl. ii. t. 164 (*S. verticillata*).

Stem slender, a foot or more long, with fibrous roots, much branched, flaccid, internodes long or short, nodes often rooting ; branches with a short sheathing l. at the base, upper floating ; l. $\frac{1}{4}$–$\frac{1}{2}$ in., sessile, spreading or recurved, lower sometimes opp., linear or linear-oblong acute or apiculate, entire or serrulate, costa stout, veins 0; spathe of male fl. muricate; sep. ovate or obovate, very variable ; pet. cuneate, reflexed ; fil. short, anth. large, bursting elastically ; fr. squarrosely muricate.

Ponds and still water up to 2000 ft.; common. Fl. Feb.
Trop. Asia and Australia, Madagascar, Mauritius, Cent. Europe.
Variable in foliage. The ordinary Ceylon plant is exactly *H. Wightii*, Planch. of India, not distinguishable as a species. A very large form is a great pest in the Lake at Colombo.
The little membranous utricular spathe of the male fl. ultimately splits vertically into two valves, liberating the flower-bud, which separates from the plant and rises to the surface of the water, where it floats, expands, and scatters its pollen.

2. **LAGAROSIPHON,** *Harv.*

Submerged fresh-water herbs ; l. scattered fascicled or subwhorled, linear, serrulate, lower sometimes opposite ; fl.

very minute, diœcious, male many, pedicelled on a short spadix contained in an ovoid bifid or 2-valved sessile axillary spathe; sep. 3, petaloid; pet. 3; stam. 2–3, anth. dehiscing transversely; pistillode, 0; fem. fl. solitary in a narrow spathe; perianth minute on the filiform top of the ov.; sep. 3, orbicular or cuneate-obovate; pet. 3, as long; staminodes 0; ov. oblong, narrowed into a filiform beak, styles 3, stout, notched or bifid, ovules many, orthotropous; fr. narrowly lanceolate, terete, membranous, many-seeded; seeds oblong, testa with a mucous coat.—Sp. about 5; 1 in *Fl. B. Ind.*

I. Roxburghii, *Benth. in Gen. Pl.* iii. 451 (1883).
Nechamandra alternifolia, Thw Enum. 332. *N. Roxburghii*, Planch. C. P. 3176.
Fl. B. Ind. v. 659. Hook. Bot. Misc. ii. t. suppl. 11 (*Vallisneria alternifolia*, *Roxb.*).

Stem 2–3 ft., filiform, roots fibrous, flaccid, upper branches floating; l. 3–4 in. by $\frac{1}{4}$ broad, alt. and opp., sessile, oblong-lanceolate, acute, serrate, veins one on each side of the slender midrib; male spathes in pairs, ovoid, acute, at length 2-valved; fl. very minute, bud globose; sep. broadly oblong, pink; pet. as long, white; stam. 2, fil. clavellate; fem. spathe $\frac{1}{6}$ in., bifid; ov. lanceolate, narrowed into a filiform flexuous beak 2–3 in. long.

Tanks in the dry region; very rare. Near Batticaloa (Gardner, Nevill). Fl. March, September.
Tropical Asia generally.
As in *Hydrilla*, the male fl. escape from their spathe, rise to the surface of the water, and there float, expand, and scatter their pollen.

[*Vallisneria spiralis*, L., is given for Ceylon in Fl. B. Ind. v. 660. The specimen so named in Herb. Kew is C. P. 237, and *Blyxa zeylanica.*]

3. BLYXA, *Thouars.*

Submerged, scapigerous, fresh-water herbs; stem very short; l. long, narrow, quite entire; fl. uni- or bi-sexual, male several, pedicelled, enclosed in a 2-toothed peduncled spathe; sep. 3, linear; pet. 3, narrower and longer; stam. 3, anth. linear; pistillodes 3, filiform; fem. fl. solitary, long-pedicelled, enclosed in a long-peduncled spathe; sep. and pet. of male; staminodes 0; ov. very slender, long-beaked; styles 3, filiform; fr. included in the spathe, long, narrow, terete, membranous, 1-celled, with 3 parietal many-ovuled placentas; seeds many, minute, testa mucilaginous.—Sp. 7; all in *Fl. B. Ind.*

B. zeylanica, *Hk. f. in Fl. B. Ind.* v. 661 (1888). **Diya-hawari,** *S.*

Vallisneria octandra (?), Moon, Cat. 67. *B. octandra*, Planch. in Thw. Enum. 332. C. P. 237.

Fl. B. Ind. v. 661 (*ceylanica*).

Stems tufted on a short rootstock, very short; l. ½–2 ft. by ⅓ in. broad, flaccid, narrowed from the base to the acuminate tip, midrib and 2–3 pairs of veins very slender; fl. bisexual; ped. 1–2 ft., spathe 1-3 in.; ov. as long as the spathe, tip exserted, produced into a filiform beak 1–2 in. long supporting the perianth; sep. narrowly linear, obtuse, spreading, green; pet. as long or longer, acuminate with capillary tips; anth. narrowly linear, as long as the fil.; fr. 1–2 in., very narrow, crowned with the filiform top of the ov.; seeds many, testa rugulose or sparingly subspinulose, apiculate at both ends.

In still water in the low country below 1000 ft.; common. Fl. Oct.–Dec.; white.

Endemic (?).

'Distinguished from the common Indian *B. Roxburghii* by its (? always) hermaphrodite flowers with 3 stamens, in which it resembles *B. oryzetorum* of India. The peds. are often in deep water of an immense length. We have, perhaps, 2 species in Ceylon.'

The description of the flowers is chiefly from a drawing of the fresh plant in the Peradeniya collection. The male fl. escape from the spathe and float about, supported on the water upon the tips of the reflexed perianth-segments.—J. D. H.

4. OTTELIA, *Pers.*

Submerged fresh-water herbs; stem very short, roots fibrous; l. of two forms, narrow submerged, and broader long-petioled floating; fl. bisexual, solitary, sessile in a peduncled tubular 2-fid spathe; sep. 3; pet. larger, with short fleshy processes at their bases; stam. 6–15, anth. linear; ov. oblong, beaked, 1-celled, styles 6–12, linear, 2-fid, ovules many, parietal, and covering 6–12 intruded placentas; fr. enclosed in the ventricose winged spathe, oblong, beaked, beak crowned with the persistent perianth, fleshy, 6-valved; seeds many, minute, testa soft.—Sp. 6 or 7; 1 in *Fl. B. Ind.*

O. alismoides, *Pers. Syn. Pl.* i. 400 (1805).

Fl. Zeyl. n. 223. *Stratiotes alismoides*, L. Sp. Pl. 535. *Damasonium indicum*, Willd., Moon, Cat. 30. C. P. 2316.

Fl. B. Ind. v. 662. Roxb. Cor. Pl. ii. t. 185 (*D. indicum*). Bot. Mag. t. 1201.

A succulent flaccid herb; l. from 2–6 by 1–3 in., orbicular, to oblong-cordate, and 7 in. diam., membranous, undulate,

7–11-veined, usually submerged; petiole 3-gonous, depending for length on the depth of the water, as does the long 1-fld. ped.; spathe 1–1½ in., 5–6-winged, wings undulate, mouth 5–6-toothed; sep. small, oblong, green; pet. nearly orbicular, 1 in. broad, veins reticulate; stam. small, fil. short, anth. linear; ov. as long as the spathe, narrowly oblong, placentas 6–12; fr. 1–1½ in.

Submerged in still water in the low country below 1000 ft.; common. Fl. Feb.; very large for this Order; petals white, with a golden-yellow base.

Throughout Trop. Asia and Australia.

5. **ENHALUS,** *Rich.*

A submerged, marine, perennial herb; rootstock long, stout, creeping, crinite with the long fibres of decayed leaves; l. in pairs or threes at the nodes of the rootstock, arising from the axil of a scale, narrowly linear; fl. monœcious or diœcious; male very minute, many enclosed in a short compressed 2-valved spathe; sep. and pet. 3 each, broad; stam. 3, anth. subsessile; pistillode 0; fem. fl. much larger, solitary, sessile on a longer 2-valved spathe, which terminates a spirally coiled ped.; sep. 3, oblong, imbricate; pet. 3, linear, subvalvate; staminodes 0; ov. ovoid, long-beaked, imperfectly 6-celled, styles 6, bipartitite, arms fimbriate, ovules few; fr. ovoid, beaked, indehiscent, placentas spongy; seeds large, conical, testa cellular, mucilaginous, cotyledons subconic, green, fissured, radicle large, white, plumule many-leaved.—Monotypic.

E. Kœnigii, *Rich. in Mém. Inst. Fr.* ii. 64 (1811).
Stratiotes acoroides, L. f. Suppl. Pl. 268; Moon, Cat. 69. *E. marinus*, Griff., Thw. Enum. 332. C. P. 2296.
Fl. B. Ind. v. 663. Griff, Ic. Pl. As. tt. 249, 250.

Rootstock as thick as the middle finger, branched, creeping and rooting in sand; roots long, vermiform; l. 2–3 ft., by ½–¾ in. broad, loriform, tip rounded or truncate, toothed, margins thickened, veins very slender, bases enclosed two or three together in a membranous sheath; male spathe sessile or shortly peduncled, about 1 in. long, ovoid, strigose; fl. minute, globose in bud, long-pedicelled, crowded on a short spadix; sep. and pet. broadly ovate, obtuse; anth. large, papillose; fem. spathe on a very long spiral peduncle, narrowly oblong, about 2 in. long, compressed, valves at length spreading and recurved, strigose; fem. fl. much larger than the male, sep. oblong, pet. longer, linear, upper surface transversely corrugated;

ov. flagon-shaped, long-beaked, compressed, 1-celled, with 6 papillose ridges, stigmas 12, linear, papillose, ovules 1-seriate on 6 parietal placentas; fr. ovoid, spongy, strigose, bursting irregularly, imperfectly 6-celled; seeds large, angular, testa cellular, radicle large, cotyledons subconic, plumule many-leaved.

In salt-water shallows of 2 or 3 ft. in the dry region; rare. About Jaffna, abundant; Kalpitiya on W. Coast. Fl. Sept.

S. India, Malaya, Australia.

This plant is also very abundant in the shallow parts of the Pamban Channel between the mainland of India and Rameswaram I., just out of our boundaries. Kœnig first collected this, 'inter insulas Zeylanicas.'

The leaves grow straight upwards to the surface of the water, and are usually somewhat twisted together spirally. The fruit scape is very much longer than the leaves, and the fruit lies floating on the water.

6. **THALASSIA,** *Soland.*

Submerged, marine, perennial herbs; rootstock creeping, annulate; l. in pairs or threes at the nodes of the rootstock, arising from the axil of a membranous sheath, linear, coriaceous; fl. monœcious, solitary, in a 2-valved spathe; male fl. with the valves of the spathe connate at the base; sep. 3, petaloid; pet. 0; stam. 6, fil. very short, anth. linear, erect, 2-celled, dehiscence lateral; pistillode 0; fem. fl. in a caducous spathe, at length pedicelled; ov. 1-celled, ovules many, on parietal placentas; fr. stipitate, globose, beaked by the style, smooth rugose or echinate with soft spines, coriaceous, 6-valved, valves persistent, stellately spreading, laciniate; seeds many, small, imbedded in mucilage, embryo macropodous.—Sp. 3 or 4; 1 in *Fl. B. Ind.*

T. Hemprichii, *Aschers. in Naturf. Fr. Berl.* 83 (1870). **Chatelai,** *T.*

Trim. Syst. Cat. Ceyl. 86 (excl. syn. from Thw. Enum.).

Fl. B. Ind. vi. 570 (name only). Hempr. and Ehrenb. Symb. Phys. Bot. t. xx. (cop. in Engl. Nat. Pflanzen, fam. ii. f. 188).

Rootstock as thick as a duck's quill, internodes 1–3 in.; root fibres densely woolly with matted root-hairs; young shoots clothed with hyaline sheaths; l. 8–12 by $\frac{1}{3}$ in., linear, falcate, spreading, tip rounded, margins smooth, 10–12-veined; male fl.:—pet. 1 in. long, oblong, tip rounded; anth. stout, linear, apiculate; fr. softly echinulate.

In sea-water shallows of 1–2 ft.; rare. Jaffna, abundant; Dondra Head, S. Prov.; Wéligama Bay (?). Fl. Dec., Feb.

Also on coasts of Red Sea, Indian Ocean, Malay and Pacific Islands.

The falcate leaves spread stiffly over the sandy bottom, never standing

upright in the water; they are almost precisely similar to those of *Cymodocea serrulata*, and I am doubtful whether the Weligama plant may not be that species. In Syst. Cat. Ceyl. l. c. I have also inadvertently referred Thwaites' specimens of the *Cymodocea* to this. The Jaffna specimens were in good fruit (in February), and thus readily identified. During the S.W. monsoon this is washed ashore in large quantities at Jaffna, and is extensively used as a manure for cocoanuts and also for paddy, as well as to slacken the action of the wood fires in burning the coral-stone for lime.—*Trimen.*

7. **HALOPHILA,** *Thouars.*

Submerged, perennial, marine herbs; rootstock slender, creeping, branched; l. in pairs at the nodes of the rootstock, or on short branches, with a hyaline amplexicaul sheath at the base, oval oblong or linear; fl. very small, monœcious, axillary, in 2-leaved hyaline spathes; male pedicelled; sep. 3, ovate, imbricate, hyaline; stam. 3, linear, 4-celled, pollen confervoid; fem. fl. sessile, sep. 3 on the apex of the beak of the ov., most minute; pet. 0; ov. ovoid, membranous, produced into a slender erect beak, slightly dilated at the apex, 1-celled, full of viscous fluid, styles 3, capillary, caducous, ovules few or many, on 3 parietal placentas, anatropous; fr. a beaked utricle; seeds globose, translucent, testa membranous, minutely tubercled, embryo macropodous with the spirally coiled embryo in a pit at the top.—Sp. 8 or more; 2 in *Fl. B. Ind.*

L. ovate or oblong, with branching veins . . . 1. H. OVATA.
L. linear, without branching veins . . . . 2. H. BECCARII.

1. **H. ovata,** *Gaudich in Freyc. Voy. Bot.* 430 (1826).

Thalassia stipulacea, Thw. Enum. 332 (non Koen.). *H. ovalis*, Hk. f., Trim. Syst. Cat. 86. C. P. 3055.

Fl. B. Ind. v. 663. Griff. Ic. Pl. Asiat. t. 161 C, f. 2 (*Diplanthera*). Balfour in Trans. Bot. Soc. Edinb. xiii. (1879), p. 290, t. 8.

Rootstock filiform, much branched, branches often forming intricate masses, clothed with capillary root-hairs; l. solitary or in pairs at the nodes of the rootstock, 2–2½ in., from broadly oval to linear-oblong, glabrous, tip rounded or subacute, veins intermarginal and the costa united by faint reticulating venules; petiole ¼–2 in., filiform, base hardly dilated; spathes about $\frac{1}{20}$ in. long, male peduncled; fem. sessile or peduncled; anth. subsessile, shortly oblong, obtuse; ov. $\frac{1}{12}$ in. long, ovules about 12.

Shallow sea water on the coast in the dry region; rather common. Negombo; Chilaw; Kalpitiya; Jaffna; Aripo; Trincomalie; Batticaloa; Mannar. Fl. July–September.

Shores of Red Sea, Indian Ocean, China, Malay Is., Pacific Is., Australia.

The leaves of this pretty little marine plant vary in form and greatly in size; in the type the blade is oval-oblong, about $1\frac{1}{4}$ inch long, but it is as often almost rotund, or sometimes linear-strap-shaped, and then not more than $\frac{3}{8}$ inch long. This last very small form, from Jaffna and Trincomalie, may be called var. *minor* (= *Lemnopsis minor*, Zoll.), but there are intermediates. The brackish-water form is thought by Nevill to have narrower leaves than the ordinary marine one (see Taprobanian, ii. 67).—*Trimen.*

H. stipulacea, Aschers., is marked by Ascherson on his map in Peterm. Geog. Mitth. 1871, t. 13, as if in Ceylon. I have seen no specimens.—*Trimen.*

Amongst the specimens marked *H. ovata* in Herb. Peraden. there are some collected by H. Nevill, in six-fathom water off Chilaw, April 1881, of what appears to me to be a very different species, with very pale green, oblong, petioled leaves, covered on both surfaces with a fine pubescence, and with ciliolate margins. The petioles have no dilatation of the base. The fr. enclosed in its spathes is sessile, about $\frac{1}{8}$ in. long, and resembles that of *H. ovata.*—J. D. H.

2. **H. Beccarii,** *Aschers. in Nuov. Giorn. Bot. Ital.* iii. 302 (1871).
Trim. in Journ. Bot. xxvii. 166.
Fl. B. Ind. vi. 570 (name only).

Rootstock about as thick as a sparrow's quill, rather stiff, nodes giving off short, erect, slender, few-leaved branches $\frac{1}{2}$–1 in. long; l. $\frac{1}{2}$–$\frac{3}{8}$ in., by $\frac{1}{10}$–$\frac{1}{6}$ in., linear or lanceolate, subobtuse, apiculate, quite entire, glabrous, with one vein on each side half way between the margin and costa, but no transverse venules, base narrowed into a filiform petiole, which is dilated at the base into an auricled sheath; fl. monœcious, male spathe terminal, with often a peduncled fem. on one or both sides; spathes about $\frac{1}{10}$ in. long.

In brackish water in dry region; very rare. Found by Mr. Nevill in a lagoon ten miles south of Batticaloa in 1885.

Also in Burma and Borneo.

Easily distinguished from the small narrow-leaved varieties of *H. ovata* by the absence of lateral transverse veinlets. Both species require to be fully described from living specimens.

CXXV.—BURMANNIACEÆ.

ANNUAL, erect, saprophytic herbs; l. chiefly radical, narrow, entire, or reduced to scales, or 0; fl. bisexual, in terminal simple spikes or racemes, or secund on the branches of a forked cyme; bracts fl.-opposed; perianth superior, persistent, 6-lobed or cleft (cal.-lobes and pet.), valvate; anth. 3 or 6, sessile in the perianth-tube; ov. 3-celled, or 1-celled with 3

parietal placentas, style short, stigmas various, ovules many; fr. a loculicidal many-seeded capsule; seeds very minute, testa thin, reticulate, nucleus hard, homogeneous.

Stamens 3, ov. 3-celled . . . . 1. BURMANNIA.
Stamens 6, ov. 1-celled . . . . 2. THISMIA.

1. BURMANNIA,* *L.*

Annual herbs; stem simple or forked; l. linear, subulate, or reduced to scales, or 0; fl. solitary or secund on the branches of a forked cyme; cal.-tube compressed, winged, limb superior, persistent, tubular, shortly 3-lobed; pet. 3, smaller than the cal.-lobes; anth. 3, sessile or subsessile, opposite the pet., cells short, broad, separated by a dorsally crested connective, dehiscence transverse; ov. inferior, 3-celled, style short, 3-lobed; capsule 3-winged, dehiscing between the wings; seeds very minute, testa thin, striate or reticulate.—Sp. about 20; 8 in *Fl. B. Ind.* (probably reducible to 6).

L. ensiform . . . . 1. B. DISTICHA.
L. subulate or reduced to scales.
  Perianth-tube much shorter than the ov. . . . 2. B. CŒLESTIS.
  Perianth-tube much longer than the ov. . . . 3. B. CHAMPIONII.

1. **B. disticha,** *L. Sp. Pl.* 287 (1753). **Ma-diya-jawala,** *S.*
Herm. Mus. 7, 52. Burm. Thes. 50. Fl. Zeyl. n. 128. Moon, Cat. 24. *B. distachya*, Br., Thw. Enum. 325. C. P. 2313.
Fl. B. Ind. v. 664. Burm. Thes. t. 20, f. 1. Roxb. Cor. Pl. t. 242.

Stem with infl. 1–1½ ft., stout or slender; roots fibrous; l. at the base of the stem, 1–4 in. by ¼–½ in. broad, sessile, ensiform, subfalcate, finely acuminate, midrib obscure, veins parallel with transverse venules, cauline narrower, sheathing; fl. ½–¾ in. long, secund, crowded and subsessile on the 1–3 in. long branches of a forked cyme, oblong or oval in outline; bracts ⅙–½ in.; cal.-tube above the ov. very short, lobes ovate, concave, dorsally keeled; pet. shorter, linear-oblong; capsule with the withered perianth ½–¾ in., wings 3, truncate or rounded at the top.

Low country in moist region up to 2000 ft. or more, in wet places; rather common. Fl. March, September; bright blue.

S. India, Nepal, Khasia, China, Australia.

A beautiful plant. A drawing in Herb. Peraden. represents the bracts and flowers as vinous purple with yellowish lobes.—J. D. H.

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* Dedicated to John Burmann, Professor of Botany at Amsterdam and author of 'Thesaurus zeylanicus,' 1737. Died in 1779.

2. **B. cœlestis,** *Don, Prod. Fl. Nep.* 44 (1825).
B. pusilla, var. β, Thw. Enum. 325. *B. triflora*, Roxb. Moon, Cat. 24
C. P. 2312.
Fl. B. Ind. v. 665. Royle, Ill. Bot. Himal. t. 91, f. 1. Griff. Ic. Pl. Asiat. t. 272, f. 1 (*B. azurea*).

Whole plant 4–8 in. high, very slender, leafy at the base or nearly leafless; radical l. few, short, subulate, rarely ⅓ in. long; fl. solitary, or, if 2–3, one sessile central, the other peduncled, ¼–½ in. long, oval orbicular or obcordate in outline; bracts minute, subulate; cal.-tube very short above the ov., lobes triangular, dorsally keeled; pet. minute; capsule with the withered perianth ¼–½ in. long, wings 3, rounded, truncate or retuse at the top.

Var. β, **pusilla,** Trim. *B. pusilla*, Thw. Enum. 325 (excl. var. β).
C. P. 3023.
Gonyanthus pusilla, Miers in Trans. Linn. Soc. xviii. t. 38, f. 3.

Stem 2–6 in., l. very few, radical ⅛ in.; fl. ¼ in. long.

Swampy places, chiefly in the low country, rarely up to 4000 ft.; rather rare. Kalutara; Kukul Korale; Nilgala, Uva; Maskeliya. Var. β, Trincomalie (Glenie); Hewesse. Fl. December–March, August; pale sky-blue.

India, Burma, Andaman Is., China, Malaya, N. Australia, Mauritius.

Var. β is kept as a separate species in Fl. B. Ind., but seems to be merely a dwarf nearly or quite leafless state. *B. candida*, Griff., is given for Ceylon in Fl. B. Ind., but I suspect by error, the locality belonging to the previous species, *B. pusilla*, Thw. The species are scarcely distinct.—*Trimen.*

3. **B. Championii,** *Thw. Enum.* 325 (1864). [PLATE LXXXVII.]
Fl. B. Ind. v. 666. C. P. 2735.

Whole plant 4–6 in., rather stout, colourless, or cal.-lobes pale brown; base of stem usually tortuous and more or less covered with root fibres; l. 0, or a few distant scales on the stem; fl. crowded on the branches of a very short forked cyme, ¼–⅓ in. long, narrowly ovoid-oblong in outline; bracts small, lanceolate; cal.-tube twice or thrice as long as the trigonous wingless ov., lobes ovate-lanceolate, obtuse, punctulate; pet. much smaller, linear, truncate, punctulate; anth. half way down the tube, connective thick, 3-toothed at the top, cells globose.

Moist region below 1000 ft.; rare, growing amongst moss, dead leaves, &c., on rocks in shady streams. Karawita Kande, near Ratnapura; Mandagala Forest, Hewesse; Hiniduma; Palabadulla, Saffragamuwa. Fl. March–May; white.

Endemic.

A saprophyte; the whole plant is milk-white and very delicate. There are good drawings and description by Champion in Herb. Kew. The Bornean *B. tuberosa*, Becc. (Malesia I. 245, t. 14, f. 1–4) is very closely allied.

2. **THISMIA,** *Griff.*

Dwarf, pale herbs, with simple stems; l. 0, or reduced to scales; fl. few or solitary, terminal; cal.-tube produced far above the ov., campanulate or turbinate, at length deciduous, mouth contracted, annulate, lobes small, ovate, recurved; pet. 3, recurved; anth. 6, subsessile on the calyx-throat, connective broadly dilated, conniving or deflexed, forming a membranous curtain concealing the oval cells; ov. short, broad, 1-celled, style short, conic, stigmas 3, stout, erect; fr. turbinate.—Sp. 6; 2 in *Fl. B. Ind.*

T. Gardneriana, *Hk. f. in Thw. Enum.* 325 (1864).
T. Brunoniana, Miers in Trans. Linn. Soc. xx. 376 and 381 (non Griff.). C. P. 4009.
Fl. B. Ind. v. 666. Trans. Linn. Soc. xx. t. 15, f. 20, 21 (*T. Brunoniana*, fl. only).

A pale yellowish, or white, fleshy, saprophyte, 2–4 in. high, with simple thick spreading roots from the base of the erect or flexuous stem; l. 0, or a few scales; fl. in a terminal head, with sometimes a few lateral sessile on the stem lower down, $\frac{1}{2}$–$\frac{2}{3}$ in. long, erect; bracts subulate; cal.-tube companulate on a very small ovary, shortly 3-lobed, lobes broadly ovate, acute, mouth annulate; pet. many times longer than the cal.-lobes, as long as the cal.-tube, consisting of a narrow spreading linear column, bearing dorsally towards the tip a flexuous subulate process.

Moist low country, among dead leaves; very rare. At the roots of trees at Narawella, near Galle (Champion); Botala Kanda, Hewesse; between Eratne and Palabadala. Fl. Sept.–Oct.; orange-yellow.
Endemic.
Champion's specimens are in Herb. Kew, with good drawings. Those in Herb. Perad. (C. P. 4009) have no locality attached, but were probably from Hewesse. The allied *T. Brunoniana*, Griff., from Burma, is figured beautifully by Griffith in Trans. Linn. Soc. xix. t. 39.
The description of the petals of *T. Gardneriana* is from a drawing in Herb. Peraden. In the figure of the flower by Miers in Trans. Linn. Soc. cited above the processes of the petals are represented as simple, terete, filiform, and tortuous.—J. D. H.

CXXVI.—ORCHIDEÆ.

HERBS, rarely shrubs, of two principal forms, either terrestrial, often tuberous-rooted with simple stems and terminal infl., or epiphytes, with simple or branched jointed often pseudobulbous stems; l. alt., quite entire; perianth superior, of 6 pieces, 3

outer (sep.), 3 inner, of which 2 (*petals*) are alike, the third (*lip*) is usually larger, dissimilar, often spurred; stam. and style confluent in a column opp. the lip; anth. one, sessile on the column (or in *Apostasia* anth. 2, one on each side of the column); pollen grains cohering in each cell in 1, 2, 4 or 8 waxy or powdery masses (pollinia); ov. 1-celled (3-celled in *Apostasia*), usually narrow and twisted, stigma a viscid spot below the anther, or of 2 processes (or terminating the styliform top of the column in *Apostasia*); fr. a loculicidal capsule (rarely indehiscent), the valves separating from three persistent ribs; seeds minute, testa lax, nucleus homogeneous.

The third largest Order of flowering plants in number of species in Ceylon, ranking between *Gramineæ* and *Cyperaceæ;* and the third largest also in number of genera. In percentage of endemic species it is the fifth of all the larger Orders, nearly half the species being endemic. On the other hand, it is remarkable for the paucity of endemic genera, of which there are only three out of the whole number (61). In the arrangement of the genera, I have adhered as closely as I could to the 'Genera Plantarum' and 'Fl. Brit. Ind.' The principal deviation from these works is the placing of *Phreatia* in *Vandeæ*, in which I am supported by Dr. King. I have also restored two imperfectly known genera of Thwaites, *Octarrhena* and *Alvisia*. By far the greater number of species of Orchids have been described for this work from Herbarium specimens solely, or, if aided by published or unpublished figures, these are too often unaccompanied by good analyses. Consequently, not a few of those descriptions will require rectification or amplification from living specimens. An illustrated work on the Orchids of Ceylon, with careful analyses, like Sir G. King's Orchids of the Sikkim Himalaya, would be a great boon to botanists and amateurs. Of the 160 species described in this work, only 97 have been figured, few of them from Ceylon specimens, most in inaccessible works, and not a few very imperfectly.

Stam. 1.
- Pollinia waxy; anth. operculate.
  - Pollinia free or adhering in pairs or fours by a viscus.
    - Pollinia 4.
      - Sep. and pet. widely spreading, lip deflexed or decurved from the base.
        - Lip superior, column very short.
          - L. equitant, fleshy . . . . 1. OBERONIA.
          - L. not equitant, membranous . 2. MICROSTYLIS.
        - Lip inferior, column long . . . 3. LIPARIS.
      - Sep. and pet. more or less connivent, lip erect from the base.
        - Column prolonged into a foot.
          - Lip not articulate on the foot . 4. DENDROBIUM.
          - Lip articulate on the foot.
            - Lateral sep. not much exceeding the dorsal . . . . 5. BULBOPHYLLUM.

Lateral sep. much exceeding the dorsal . . . . . 6. CIRRHOPETALUM.
Column not prolonged into a foot.
Lip embracing the column . . 7. COELOGYNE.
Lip not embracing the column.
Column long . . . . . 8. ADRORHIZON.
Column very short . . . 9. PHOLIDOTA.
Pollinia 2 . . . . 10. CHRYSOGLOSSUM.
Pollinia 8.
Column prolonged into a foot.
Sep. connate . . . . . 11. ACANTHOPHIPPIUM.
Sep. free.
Epiphytes.
Column without appendages . 12. ERIA.
Column with 2 frontal appendages . . . . 13. ALVISIA.
Terrestrial . . . . 14. TAINIA.
Column not prolonged into a foot (or very shortly in *Phajus*).
L. distichous, not plaited.
Fl. large . . . . . . 15. ARUNDINA.
Fl. very small . . . . 16. AGROSTOPHYLLUM.
L. not distichous, plaited.
Lip not spurred . . . 17. IPSEA.
Lip spurred.
Lip inserted on the base of the column . . . 18. PHAJUS.
Lip inserted high up on the column . . . . 19. CALANTHE.
Pollinia 2 or 4 (8 in *Octarrhena*) attached singly or in pairs by straps or caudicles to a distinct viscid gland.
Anth. terminal on the column, or facing the lip.
Stem pseudobulbous or tuberous at the base.
Pollinia 2.
Terrestrial.
Lip inferior . . . . 20. EULOPHIA.
Lip superior . . . . 21. GEODORUM.
Epiphytic . . . . . 22. CYMBIDIUM.
Pollinia 4.
Lip inferior . . . . . 23. JOSEPHIA.
Lip superior . . . . . 24. POLYSTACHYA.
Stem not pseudobulbous or tuberous.
Column prolonged into a foot.
Lip truncate, mid lobe minute . 25. SARCOCHILUS.
Lip with an elongate mid lobe.
Spur saccate, laterally compressed 26. RHYNCHOSTYLIS.
Spur conical.
Lip with a forked appendage 27. DORITIS.
Lip with no forked appendage 28. AERIDES.
Column not prolonged into a foot.
Pollinia 2, on a single strap with one gland.

Lip not spurred or saccate . 29. LUISIA.
Lip spurred or saccate.
Side lobes of lip large . . 30. VANDA.
Side lobes of lip small or o.
Spurs 2, collateral . . 31. DIPLOCENTRUM.
Spur or sac single.
Mouth of spur or sac open.
Spur entire within . 32. SACCOLABIUM.
Spur septate within . 33. SARCANTHUS.
Mouth of spur closed with calli . . . . . 34. CLEISOSTOMA.
Pollinia 2, each with a strap and gland . . . . . . 35. MYSTACIDIUM.
Pollinia 4, one of each pair smaller.
Infl. panicled . . . . . 36. COTTONIA.
Infl. racemed or spicate.
Sep. and pet. connate . . 37. TAENIOPHYLLUM.
Sep. and pet. free . . . 38. DIPLOPRORA.
Pollinia 8.
Column prolonged into a foot . 39. PHREATIA.
Column without a foot . . 40. OCTARRHENA.
Anther posticous on the column, facing the dorsal sepal.
Pollinia 4 in pairs . . . 41. PODOCHILUS.
Pollen granular, powdery, or lamellate.
Anth. operculate (*Neottieæ*).
Anth. dorsal on the column, facing the dorsal sep.
Root tuberous, l. not plicate.
Lip superior.
Lip large flat . . . . 42. CRYPTOSTYLIS.
Lip small cymbiform . . . 43. HETÆRIA.
Lip inferior.
Sep. connate . . . . . . 44. CHEIROSTYLIS.
Sep. free.
Sac or spur protruded between the bases of the lateral seps.
Claw of lip entire . 45. PHYSURUS.
Claw of lip pectinate . . 46. ANÆCTOCHILUS.
Sac of lip concealed by the lateral seps.
Lip entire, cymbiform . . 47. GOODYERA.
Lip clawed, claw entire . . 48. ZEUXINE.
Lip oblong, disk hairy . . 49. SPIRANTHES.
Root fibrous, l. plicate.
Column long . . . . . . 50. CORYMBIS.
Column short . . . . . . 51. TROPIDIA.
Anth. terminal on the column or facing the lip.
L. o, or in *Vanilla* flat, not plicate.
Stem scandent . . . . . . 52. VANILLA.
Stem erect, l. o.
Sep. connate . . . . . . 53. GASTRODIA.
Sep. free.
Lip spurred . . . . . 54. EPIPOGUM.

Lip not spurred.
Column winged . . . 55. GALEOLA.
Column not winged . . 56. APHYLLORCHIS.
L. plicate . . . . 57. POGONIA.
Anth. confluent with the column, not operculate (*Ophrydeæ*).
Lip inferior.
Lip spurred . . . . . . 58. HABENARIA.
Lip not spurred . . . . . 59. DISPERIS.
Lip superior, 2-spurred . . . . 60. SATYRIUM.
Stam. 2 (*Cypripedieæ*) . . . . . 61. APOSTASIA.

1. OBERONIA, *Lindl.*

Tufted epiphytes, never pseudobulbous; stem compressed; l. distichous, equitant, ensiform oblong or linear, fleshy, veins obscure, bases often confluent with the stem or ped.; fl. very minute, densely crowded in elongate cylindric myuriform spikes, or spiciform racemes, which are usually curved or decurved in fl., more erect afterwards, sometimes in whorled fascicles, resupinate; ov. short, not twisted; perianth widely spreading, sep. subequal, broadly ovate (except *O. Scyllæ*); pet. narrower; lip superior, sessile on the base of the very short column, often shorter than the sep.; anther terminal, incumbent; pollinia 4, waxy, cohering in pairs.—Sp. 50 or 60; 45 in *Fl. B. Ind.*

The most minute flowered of Asiatic genera of Orchids, requiring a rather high magnifying power to determine the characters of the flowers.

Sep. subequal.
Pet. oblong or linear-oblong.
Bracts not longer than the fl.
Fl. not conspicuously whorled.
Lip subreniform, shorter than the sep . 1. O. TRUNCATA.
Lip 3-lobed, longer than the sep. . 2. O. RECURVA.
Fl. conspicuously whorled . . . 3. O. THWAITESII.
Bracts longer than the fl. . . . . 4. O. LONGIBRACTEATA.
Pet. linear.
Lip quadrate, entire, or obscurely lobed . 5. O. ZEYLANICA.
Lip 3-lobed.
Side lobes of lip linear, recurved . . 6. O. TENUIS.
Side lobes of lip broad, spreading.
Lip hardly longer than the sep. . . 7. O. FORCIPATA.
Lip longer than the sep. . , . 8. O. WIGHTIANA.
Lateral sep. large, orbicular, dorsal lanceolate . 9. O. SCYLLÆ.

1. **O. truncata,** *Lindl. Fol. Orchid., Ober.* 3 (1859).
Trim. Syst. Cat. 87. Thw. Enum. 296. C. P. 3913.
Fl. B. Ind. v. 677.

Stem very short; l. 3–4 by $\frac{1}{3}$–$\frac{1}{2}$ in., narrowly ensiform, subacute, straight or subfalcate; ped. adnate to the upper leaf,

shortly produced and flattened above it; spike 2–3 in., stout, curved; bracts as long as the fl., lanceolate, acuminate, serrulate; fl. very minute, about $\frac{1}{20}$ in. broad, in obscurely whorled fascicles, very shortly pedicelled; sep. triangular-ovate, acute; pet. linear-oblong, obtuse, quite entire; lip shorter than the sep., much broader than long, subreniform, with large orbicular side lobes and a short broad small mid lobe, margins quite entire; fr. subsessile, about $\frac{1}{10}$ in., turgidly ellipsoid.

Moist region at about 3–4000 ft.; rare. Warriagala, Hantane, abundant. First collected by Champion. Fl. November, December.

Endemic.

2. **O. recurva,** *Lindl. in Bot. Reg.* 1839. *Misc.* No. 8.
O. Gardneriana, Thw. Enum. 296 (1861). C. P. 593.
Fl. B. Ind. v. 680. Hook. Ic. Pl. t. 1784 A.

Stem very short; l. 1–2½ by ¼–½ in., ensiform, subacute or obtuse, nearly straight; ped. short, terete, adnate below to a small upper leaf, clothed with ovate acuminate appressed bracts; spike 2–3 in., very slender, decurved, dense-fld.; bracts as long as the ovary or shorter, margins subcrenulate; fl. about $\frac{1}{15}$ in. broad, rather long-pedicelled, in obscurely whorled fascicles; sep. broadly ovate, obtuse, reflexed; pet. obovate-oblong, obtuse, irregularly crenate; lip twice as long as the sep., 3-lobed, margins crenate or erose, side lobes large, orbicular, mid lobe broadly obcordate, 2-lobulate; fr. $\frac{1}{12}$ in., pedicel very slender, as long as the fr.

Moist region; very rare. Ambagamuwa (Gardner); Maturata (Thwaites). Fl. Feb., August; reddish-pink.

Also S. Indian Mts.

In Fl. B. Ind. this is placed among indeterminable species, owing to the absence of specimens at Kew, and the insufficiency of the description (in Enum. Pl. Zeyl.) to determine its position. An excellent drawing and good specimens are in the Peradeniya Herb., and prove it to be in no way different from the Concan *O. recurva*, which has been also described by Lindley as *O. setifera* (Fol. Orchid. Oberon. 3), owing to an error in regard to the shape of the pet.

3. **O. Thwaitesii,** *Hk. f. in Fl. B. Ind.* v. 678 (1888).
O. verticillata, var. *pubescens*, Lindl. Fol. Orch. Ober. 3; Thw. Enum. 296. C. P. 2572.
Fl. B. Ind. v. 678.

Stem very short or 0; l. 3–4 by ½ in., ensiform, straight, subacute; ped. 1–2 in., stout, terete, adnate to upper l.; spike 6–10 in., suberect or slightly curved; bracts ovate, obtuse, fimbriate; fl. minute, sessile, in distinctly whorled fascicles; ov. very short; sep. orbicular-ovate, acute; pet. broadly oblong, obtuse, erose; lip longer than the sep., obcuneately obcordate, side lobes obscure, terminal, 2-lobulate, lobules rounded with

a broad obtuse sinus, margins quite entire; fr. very small, sessile or very shortly pedicelled, subglobose.

Dry or intermediate region; rare. Puttalam; near Kurunegala. Fl. July, August; yellow.

Endemic.

Fl. B. Ind. quotes for this C. P. 2516, which is of an old (afterwards cancelled) numbering. The C. P. numbers in Herb. Kew and Herb. Lindley do not tally with those of the Peradeniya Herb. Both the former Herbs. are very deficient in species and specimens of the Ceylon Oberonias.

4. **O. longibracteata,** *Lindl. Gen. and Sp. Orch.* 15 (1830).
Lindl. Fol. Orch. Ober. 2. Thw. Enum. 296. C. P. 543.
Fl. B. Ind. v. 678.

Stem 1–6 in., flexuous, flattened above; l. 2–3 by $\frac{1}{4}$–$\frac{1}{3}$ in., nearly straight, linear or linear-oblong, acute; ped. adnate to the upper leaf, very slender; spike sharply decurved, 1–2 in. long, slender; bracts $\frac{1}{5}$ in. and upwards, subulate, quite entire, much longer than the sessile fl., which are about $\frac{1}{20}$ in. broad, and whorled; sep. broadly ovate, obtuse, petals broadly oblong, quite entire, tip rounded; lip hardly longer than the sep., broadly 3-lobed, side lobes small, orbicular, mid lobe large, orbicular, retuse or obscurely 2-lobed; fr. $\frac{1}{10}$ in. long, pyriform, pedicelled, strongly ribbed.

Montane zone 3-6000 ft.; rather rare. Hantane; Hewaheta; Hakgala. October–March; pale red, lip darker red.

Endemic.

5. **O. zeylanica,** *Hk. f. in Ic. Plant.* xviii. t. 1782 (1888).
O. Brunoniana, Trim. Syst. Cat. 87 (non Wight). C. P. 3869.
Fl. B. Ind. v. 680. Hook. Ic. Pl. t. 1782, f. A.

Stem very short; l. few, 4–7 by $\frac{1}{2}$–$\frac{3}{4}$ in., linear-ensiform or loriform, obtuse, nearly straight; ped. 3–4 in., very stout, hardly compressed, with a small adnate leaf reaching to about the middle; spike 3 in., very stout, straight, curved or decurved, dense-fld.; bracts ovate, acuminate, sub-entire; fl. subsessile, in dense fascicles, about $\frac{1}{10}$ in. broad; sep. triangular-ovate; pet. linear; lip longer than the sep., quadrate, obscurely lobed towards the angles, margins quite entire; fr. sessile, broadly ellipsoid, $\frac{1}{8}$ in. long.

Montane zone 4-6000 ft.; rare. East Matale (Beckett); Hakgala. Fl. December, January.

Endemic.

6. **O. tenuis,** *Lindl. Fol. Orchid.*, Ober. 3 (1859).
Thw. Enum. 296. C. P. 2654.
Fl. B. Ind. v. 682. Hook. Ic. Pl. t. 1779, f. B.

Whole plant 2–3 in. high; l. few, 1–3 by $\frac{1}{4}$–$\frac{1}{3}$ in., oblong or ensiform, acute; ped. very short, slender, bracteate to the base, bracts subulate or setaceous, hyaline, quite entire, longer than the very minute ($\frac{1}{20}$ in.) pedicelled fl.; raceme 2–5 in.,

sub-erect or decurved, rachis very slender, fl. in rather distant sub-whorled fascicles; sep. orbicular-ovate; pet. linear, sub-spathulate; lip much shorter than the sep., 3-lobed, mid lobe very short, hatchet-shaped, side lobes linear, falcate, ascending and together forming more or less of a wide circle round the column; fr. $\frac{1}{10}$ in., clavate, pedicel nearly as long, slender.

Moist low country; very rare (?). Sittawaka (Thwaites); Hantane (?). Fl. March; very pale with a coral-red lip.
Endemic.

7. **O. forcipata,** *Lindl. Fol. Orch.*, Ober. 2 (1859).
Thw. Enum. 296. C. P. 2511.
Fl. B. Ind. v. 681. Hook. Ic. Pl. t. 1782, f. B (flower only).

Stem short; l. few, 4–5 by $\frac{1}{3}$–$\frac{3}{4}$ in., ensiform, straight or subfalcate; ped. 2–3 in., not or rarely adnate to a l., gradually dilated (and 2-winged?) from about the middle to the base; spike 4–7 in., very slender, decurved, dense-fld., about $\frac{1}{10}$ in. diam.; bracts as long as the fl., ovate, acute, erose or fimbriate; fl. sessile, very minute, and closely packed in whorled fascicles; ov. very short; sep. triangular-ovate, obtuse; pet. linear; lip rather longer than the sep., rather broader than long, 3-lobed, margins crenulate, side lobes large, rounded, mid lobe short, broad, retuse or bilobulate; fr. short, sessile, $\frac{1}{10}$–$\frac{1}{8}$ in. long, turgidly pyriform, strongly ribbed.

Moist region 1–4000 ft.; rather rare. Peradeniya; Hewaheta. Fl. October–January; dull yellow.
Endemic.
The figure of the lip in Hook. Ic. Plant (1782 B) is inaccurate.

8. **O. Wightiana,** *Lindl. in. Bot. Reg.* xxv. Misc. 14 (1839).
Lindl. Fol. Orch. Ober. 5. Thw. Enum. 296. C. P. 2506.
Fl. B. Ind. v. 683. Wight, Ic. t. 1627 and t. 1628 (*O. Arnottiana*).
Hook. Ic. Pl. t. 1784, f. B (very small specimen).

Whole plant 2–6 in.; l. few, 1–4 in., linear-oblong or ensiform, obtuse or acute; ped. short, terete, clothed with a few bracts, raceme 4–6 in., slender, decurved, lax fld.; bracts oblong or lanceolate, as long as the very minute pedicelled fl.; sep. oblong-ovate, obtuse; pet. linear, obtuse; lip longer than the sep., 3-lobed, side lobes orbicular or broadly oblong, mid lobe cleft to the base into linear diverging entire or toothed segm.; fr. $\frac{1}{10}$ in., subglobose, pedicel as long.

Montane zone 4–7000 ft.; rather common. N. Eliya; Ramboda; Horton Plains; Hantane. Fl. Sept.–Dec.; pale greenish yellow. The pedicels vary in length considerably.
Also in S. Indian mountains.

9. **O. Scyllæ,** *Lindl. Fol. Orch.*, Ober. 5 (1859).
Thw. Enum. 296. C. P. 3124.
Fl. B. Ind. v. 684. Hook. Ic. Pl. t. 1781.

Stem very short; l. few, 1½–2½ in., linear or lanceolate, acuminate; ped. 1½ in., filiform, crinite with filiform hyaline spreading empty bracts ⅛ in. long; raceme about as long as the scape, slender, erect or curved; fl. whorled, pedicelled, much shorter than the incurved bracts; dorsal sep. lanceolate, acuminate, lateral larger, orbicular; pet. much larger than the sep., falcately linear-lanceolate, acuminate, ciliate, spreading; lip very small, side lobes linear, erect, parallel, much smaller than the pet., mid lobe broadly semi-lunate, ciliate, very much smaller than the lateral sep.

Montane zone 4–6000 ft.; Maturata; Elephant Plains; E. Matale; Hunasgiriya. Jan.–May; deep pink, and of a very extraordinary appearance.

Endemic.

2. MICROSTYLIS, *Nutt.*

Terrestrial or epiphytic herbs, some of them sometimes pseudobulbous; l. not articulate with the sheath, broad, membranous, plicate, 5–7-nerved; fl. small, in terminal peduncled racemes or spikes, resupinate; ov. not twisted; perianth widely spreading; lateral sep. linear or oblong, usually broader and shorter than the dorsal, often deflexed under the lip; pet. as long, narrower, spreading; lip adnate to the base of the column, superior, short, broad, entire or pectinate; column short, often constricted in the middle; anth. terminal, incumbent; pollinia 4, ovoid or obovoid, waxy. —Sp. about 50; 22 in *Fl. B. Ind.*

Base of lip biauricled . . . . 1. M. PURPUREA.
Base of lip not biauricled.
  Lip not deeply toothed or pectinate.
    Lip quite entire . . . . 2. M. DISCOLOR.
    Lip 3-crenate at tip . . . . 3. M. CONGESTA.
  Lip deeply toothed or pectinate.
    Stem elongate.
      Arms of column short or 0 . . . . . 4. M. RHEEDII.
      Arms of column speading . . . . . 5. M. VERSICOLOR.
    Stem very short or 0 . . . . 6. M. LANCIFOLIA.

1. **M. purpurea,** *Lindl. Gen. and Sp. Orch.* 20 (1830).

Thw. Enum. 297, 429. Ridley in Journ. Linn. Soc. xxiv. 540. C. P. 3768.

Fl. B. Ind. v. 687.

Stem 3–4 in., stout, base pseudobulbous; l. 4–6, petioled, 3–4 in. long, oval to suborbicular, acute or acuminate, 5–6-veined, base very unequal; ped. 6–10 in., with many reflexed bracts, many-fld.; bracts as long as or shorter than the ov., deflexed; fl. ½ in. from dorsal sep. to tip of lip, dorsal sep.

rather broad, 3-veined; pet. linear; lip rather fleshy, very concave; basal auricles narrowing upwards, obtuse, sides dilated, tip narrowed, obtusely 2-fid; column very short, arms obscure; fr. ⅔ in., clavate, shortly pedicelled.

Shady places by streams in the moist region below 1000 ft.; very rare. Mapalagama, near Galle; Pasdun Korale. Fl. June–August; dark purple.

Endemic (?) Also in Java (?).

2. **M. discolor,** *Lindl. Gen. and Sp. Orch.* 20 (1830).

Thw. Enum. 297. Ridley, l. c. 336. C. P. 3698.

Fl. B. Ind. v. 689. Wight, Ic. t. 1631. Bot. Mag. t. 5403.

Stem stout below, not pseudobulbous; l. 3–6, 2–3 in. long and broad, sessile or shortly petioled, oval or ovate, acute or acuminate, 5–7-veined, base very unequal-sided, often vinous purple with crisped green margins; ped. with raceme, 2–4 in.; bracts as long as or longer than the slender pedicels, subulate, reflexed; fl. minute; sep. ovate, decurved; pet. linear, obtuse; lip small, ovate or cordate or subreniform, quite entire, tip rounded; column short, arms projecting forward, long, obtuse; fr. ⅓ in., clavate.

Damp forests in the moist region 1– 6000 ft.; rather common. Fl. July; at first yellow, then turning purplish-red, whence the specific name. Leaves often of a fine purple colour, as in the Bot. Mag. figure.

Endemic.

3. **M. congesta,** *Rchb. f. in Walp. Ann.* vi. 206 (1861).

Dienia fusca, Lindl. Gen. and Sp. Orch. 22; Thw. Enum. 297. Ridley, l. c. 335. C. P. 3182, 3950.

Fl. B. Ind. v. 689. Ann. Bot. Gard. Calc. viii. t. 23.

Stem 2–6 in., stout, base pseudobulbous; l. 3–6, sessile or petioled, 3–10 in. long, ovate or lanceolate, acuminate, 5–7 veined; ped. 6–10 in., stout, furrowed, with a few subulate reflexed bracts; spike 3–6 in., cylindric, dense-fld.; bracts about as long as the ov., subulate-lanceolate, lower deflexed; fl. $\frac{1}{10}$–⅛ in. long; dorsal sep. oblong, sides recurved, lateral larger, oblong, obtuse, deflexed; pet. linear; lip ovate-oblong, concave, with a fold under the column, 3-lobed, side-lobes broad, obtuse, mid-lobe small, ovate, obtuse; columnar arms short, erect; fr. crowded, erect, ¼ in., turgidly clavate, shortly pedicelled.

Moist region 1–3000 ft.; rather common. About Kandy; Peradeniya; Ambagamuwa; Pussalawa; Hiniduma; Ramboda. Fl. July; dull purple.

India, Burma, Andaman Is., Malaya, China, Australia.

4. **M. Rheedii,** *Wight, Ic.* iii. II. 9 (1843) (? Lindl.).

M. versicolor, Lindl. Gen. and Sp. Orch. 21. Ridley, l. c. 343 (part). *Malaxis Rheedii,* Moon, Cat. 60. Thw. Enum. 296. C. P. 2375.

Fl. B. Ind. v. 690 (not given for Ceylon). Wight, Ic. t. 902. Hook. Ic. Pl. t. 1832.

Stem 4–12 in., base swollen or not, stoloniferous; l. 3–6, petioled, 3–7 in. long, broadly ovate to orbicular, acute or acuminate, 5–7-veined, bright green above, silvery or purplish beneath, base unequal, narrowed, rounded or lobed on one side, petiole $\frac{1}{2}$–3 in., rarely 0; ped. 3–9 in., stout or slender, furrowed; bracts about as long as the fl., lanceolate, deflexed; fl. about $\frac{1}{6}$ in. long, pedicel slender; sep. linear, obtuse, dorsal longest and narrowest; pet. oblong, obtuse, connivent with the lateral sep.; lip short, rounded, reniform, or fan-shaped, pectinate; column somewhat constricted in the middle; truncate, arms short or 0; fr. $\frac{1}{3}$ in., oblong-clavate, erect, pedicelled.

Shady places in moist region 2–4000 ft.; rather rare. Dolosbagie; Ambagamuwa. Moon's locality is Kalutara. Fl. May–July; pale orange-yellow, red when withering.

Also in S. India.

Lindley's name, *versicolor*, has priority over Wight's; but this is undoubtedly the plant of Rheede, which Lindley confused with other species.

5. **M. versicolor,** *Wight, Ic.* iii. II. 9 (1843 (non Lindl.).

M. Rheedii, Thw. Enum. 296 (part), (non Wight). *M. luteola*, Wight, Ic. v. I. 4; Trim. Syst. Cat. Ceyl. 87. *M. versicolor*, Ridley, l. c. 344 (part). C. P. 2743.

Fl. B. Ind. v. 691. Wight, Ic. t. 901, and t. 1632 (*M. luteola*).

Stem 3–6 in., base pseudobulbous; pseudobulbs at length globose, $\frac{2}{3}$ in. diam., annulate; l. 2–3, sessile or shortly petioled, 2–3 in. long, ovate to lanceolate, acute or acuminate, 5-veined, margins waved; ped. 1–3 in., with a few deflexed empty bracts; raceme 2–4 in.; bracts about as long as the fl., lanceolate, deflexed; fl. about $\frac{1}{6}$ in. long, pedicelled; sep. linear-oblong, lateral deflexed, dorsal narrowest; pet. linear, obtuse; lip subquadrate, broader than long, pectinate; column constricted in the middle, sides produced at the top into short suberect horns; fr. about $\frac{1}{6}$ in., pedicelled, pyriform.

Moist low country below 1000 ft.; very rare. Only at Ratnapura. Fl. March; yellow or greenish-yellow

Also in S. India.

Thwaites combined this with *M. Rheedii*, but it is very distinct. *M. luteola* differs from the type only by its larger flowers.

6. **M. lancifolia,** Thw. Enum. 297 (1861).

Ridley, l. c. 346. C. P. 2742.

Fl. B. Ind. v. 691. Hook. Ic. Pl. t. 1830.

Stem 0, or very short; l. 5–6 or more, long-petioled, erect, 2–3 in. long, lanceolate or oblanceolate, acuminate, 3-veined; petiole $\frac{1}{2}$–$1\frac{1}{4}$ in.; ped. short, or long, with many spreading subulate empty bracts; raceme 4–6 in., much elongating in

fr.; bracts as long as the ov., subulate, erect or spreading; fl. about ⅛ in. long, pedicelled; lateral sep. falcately oblong, gibbous, obtuse, shorter than the linear dorsal; pet. linear, obtuse; lip broader than long, semicircular, with the base convex, pectinately 7-toothed, mid tooth shortest, broadest, triangular; column short, sides produced at the top into short spreading wings; fr. ⅓ in., ellipsoid, pedicelled.

Moist region below 2000 ft.; on rocks in streams; very rare. Karawita Kande, near Ratnapura, abundant. Fl. March, September; yellow (?). Endemic.

3. LIPARIS, *Rich.*

Stems simple, tufted, pseudobulbous or not (a slender rhizome in *L. disticha*); l. solitary or few, membranous and continuous with the sheath, or thicker and jointed on the sheath or pseudobulb; fl. in terminal racemes; sep. spreading, margins recurved or revolute; pet. as long, narrowly linear; lip inferior, adnate to the base of the column, usually broad and deflexed or recurved from the base; column long, incurved, usually slender, often winged towards the top; anth. terminal, 2-celled, pollinia 4, ovoid, waxy.—Sp. about 120; 64 in *Fl. B. Ind.*

Raceme with quaquaversal fl., bracts membranous.
  L. plaited, not jointed on the sheath.
    Stem very short or 0.
      L. solitary . . . . 1. L. THWAITESII.
      L. 2 or 3.
        L. 2–3 in. long . . . . . . 2. L. WIGHTIANA.
        L. 1–1½ in. long . . . . . . 3. L. TRIMENII.
    Stem elongate.
      Bracts minute . . . . 4. L. BARBATA.
      Bracts moderately long.
        Column long, very stout . . . . 5. L. NERVOSA.
        Column long, slender.
          Wings of column uncinate . . . 6. L. WALKERIÆ.
          Wings of column rounded . . . 7. L. ATROPURPUREA.
        Column short . . . . . . 8. L. BRACHYGLOTTIS.
  L. subcoriaceous, jointed on the sheath.
    Raceme shorter than the l. . . . . 9. L. OBSCURA.
    Raceme longer than the l.
      Lip deflexed from the middle . . . 10. L. LONGIPES.
      Lip deflexed from near the base . . 11. L. VIRIDIFLORA.
Raceme with distichous fl. . . . . . 12. L. DISTICHA.

1. **L. Thwaitesii,** *Hk. f. in Fl. B. Ind.* v. 692 (1890).

L. Wightiana, Thw. Enum. 295 (part). Ridley in Journ. Linn. Soc. xxii. 278. C. P. 3179 (part).

Fl. B. Ind. v. 692. Hook. Ic. Pl. t. 2006.

Stem short, swollen at the base, closely sheathed; l. solitary, 2½–3 in. long, sessile or very shortly petioled, ovate or

ovate-cordate, acuminate, 5–7-veined, membranous, margin undulate-crenulate, base equal-sided; ped. with the long-fld. raceme slender, nearly 6 in. high, with a few lanceolate empty bracts; bracts shorter than the slender pedicel and ovary, spreading; fl. suberect, $\frac{3}{4}$ in. long; sep. 3-veined, flat, dorsal, linear, obtuse, reflexed, lateral much broader, oblong, acute, placed under the lip, 3-veined; pet. very narrowly linear, 1-veined, falcately decurved; lip rather longer than the sep., broadly or cuneately obovate, flat, tip rounded or retuse, disk 5-veined, with 2 small acute calli at the very base, lateral veins branching outwards; column slender, strongly incurved towards the 2-toothed tip.

Moist low country; rare. I have only seen one specimen collected by Thwaites in Pasdun Korale. Fl. Aug.

Endemic.

Thwaites and Ridley did not distinguish this from *L. Wightiana.*

2. **L. Wightiana,** *Thw. Enum.* 295 (1861).
L. atropurpurea, Wight, Ic. iii. II. 9 (non Lindl.). C. P. 3179.
Fl. B. Ind. v. 695. Wight, Ic. t. 904.

Stem short, base swollen; l. 2, subopposite, sessile or petioled, 2–3 in. long, ovate or ovate-lanceolate, acuminate, 3–5 veined, membranous, often purple, base rounded, equal-sided; petiole 0–$\frac{3}{4}$ in.; ped. with the lax-fld. raceme 2–4 in., naked; bracts ovate-lanceolate, half as long as the pedicel and ovary; fl. about $\frac{1}{3}$ in. long; sep. oblong-lanceolate, acuminate, 3-veined, dorsal reflexed, lateral placed under the lip; pet. narrowly linear, falcately decurved, margins revolute; lip orbicular or orbicular-oblong, $\frac{1}{4}$–$\frac{1}{3}$ in. long, flat, tip rounded, retuse, or notched, veins radiating, base of disk with 2 minute calli; column very slender, strongly incurved from the swollen base, tip 2-toothed.

Shady places in montane zone 3–6000 ft.; rather common. Hantane; Madulkelle; Dimbula; Wattakelle; Maturata; N. Eliya. Fl. September–November; sep. green, lip usually purple, sometimes yellowish-green, and the flowers considerably larger (not smaller, as stated in Fl. B. Ind.) than those of *L. Thwaitesii.* The leaves often more or less purple.

Also Mts. of S. India.

There is in Herb. Peraden. a figure of a plant named by Trimen *L. Wightiana*, Thw. Var., with much stouter pedicels, smaller all green fl., and a more quadrate lip, $\frac{1}{10}$ in. diam.

3. **L. Trimenii,** *Ridley in Journ. Linn. Soc.* xxiv. 350 (1888).
Trim. in Journ. Bot. xxvii. 167.
Fl. B. Ind. v. 695. Hook. Ic. Pl. t. 1836.

Stem 0–$\frac{1}{2}$ in., hardly pseudobulbous; l. 2–3, sessile or very shortly petioled, lanceolate, acuminate, strongly many-veined base equal-sided, acute or cuneate; ped. with lax-fld. raceme

$\frac{1}{2}$–$\frac{1}{3}$ in., slender, with few empty bracts; lower bracts $\frac{1}{5}$ in., erecto-patent, membranous, lanceolate, acuminate, upper shorter than the pedicel and ovary; fl. about $\frac{1}{4}$ in. broad; sep. pet. lip and column as in *L. Wightiana*, but much smaller; fr. ellipsoid, $\frac{1}{4}$–$\frac{1}{6}$ in., rather longer than its pedicel.

Lower montane zone; very rare. Horagala, Dolosbagie. Fl. September. Endemic.

Scarcely distinct from *L. Wightiana.*

4. **L. barbata,** *Lindl. Gen. and Sp. Orch.* 27 (1830). Thw. Enum. 295. Ridl. in Journ. Linn. Soc. xxii. 276. Fl. B. Ind. v. 696.

Stem 1$\frac{1}{4}$ in., swollen at the base; l. 3, subsessile, about 2 in. long, ovate or oval, subacute, membranous, veins very slender; ped. angular, with the lax few-fld. raceme about 2 in., pedicel with the ovary about $\frac{1}{3}$ in.; bracts very minute, ovate, acuminate; fl. about $\frac{1}{3}$ in. long; sep. oblong, dorsal narrowest, 1-veined, lateral spreading, 3-veined; pet. placed under the lip, narrowly linear, obtuse; lip oblong, base 2-auricled, 2-tubercled, tip erose and subfimbriate; column incurved, wings short, rounded, toothed.

Ceylon; Macrae. A single specimen, without further locality, in Herb. Lindley (now at Kew), is all that is known of this species. Endemic.

The specimens are very insufficient. I do not find the lip to be bearded as described by Lindley.

5. **L. nervosa,** *Lindl. Gen. and Sp. Orch.* 26 (1830). *L. paradoxa, Rchb. f. in Walp. Ann.* vi. 218. *L. odorata*, Lindl.; Thw. Enum. 295. *Empusa paradoxa*, Lindl.; Thw. Enum. 429. C. P. 3180 (3375).

Fl. B. Ind. v. 697. Ann. Bot. Gard. Calcutt. viii. t. 34 (*L. paradoxa*). Rheede, Hort. Mal. xii. t. 28.

Stem elongate, base more or less swollen; l. 1–5, sessile, erect, 2–8 in. long, lanceolate, obtuse acute or acuminate, rarely more oval and narrowed into a broad petiole, rather thickly membranous, veins strong, base equal; ped. with the lax-many-fld. raceme 4–10 in., stout, rigid, angular, naked or nearly so; bracts $\frac{1}{8}$–$\frac{1}{6}$ in., ovate or lanceolate, spreading; pedicels with the ovary rather longer, stout; fl. about $\frac{1}{3}$ in. long, perianth rather thick, sep. obtuse, dorsal longest, linear, obtuse, margins revolute, 5-veined; lateral oblong, obtuse, spreading and recurved, placed under the lip; pet. narrowly linear, decurved, margins revolute; lip revolute or recurved from the middle, cuneately obovate or obcordate, tip 3-fid., base 2-tubercled; column stout, enlarged and incurved toward the top only, with two rounded wings.

Moist region 2–5000 ft.; rather common. Ambagamuwa; Dolosbagie; Adam's Peak; Ramboda. Fl. Feb., March, and July–Sept.; pale yellow, often tinged with pink or green.

India, Siam, Java, China, Japan.

The leaves vary greatly in shape and size. *L. odorata*, Lindl. Gen. and Sp. Orchid. 26, is an early name, but the flowers are scentless. *L. nervosa*, Lindl. l. c., is as early, and is unexceptionable.

6. **L. Walkeriæ,** *Graham in Bot. Mag.* t. 3770 (1839).
Thw. Enum. 295. Ridley, l. c. xxii., in Journ. Linn. Soc. 277. C. P. 2376.
Fl. B. Ind. v. 698. Bot. Mag. l. c.

Stem stout, clothed with purplish sheaths, base swollen; l. 2–3, sessile or petioled, 2–4 in. long, ovate or orbicular, acute, membranous, 7-veined, base sometimes very unequal-sided; ped. with many-fld. raceme 3–6 in., with a few empty bracts; pedicel with ov. $\frac{1}{5}$ in., longer than the lanceolate spreading bracts; sep. obtuse, 5-veined, lateral falcately oblong, diverging from the lip, flat, spreading, dorsal longer, erect, linear-oblong, sides recurved; pet. narrowly linear, obtuse, widely spreading, margins revolute; lip orbicular (when spread out), crenulate, recurved from the middle, rather fleshy, wrinkled; column long, incurved, apical wings uncinate.

Montane zone to 6000 ft.; rare. Ramboda; Pedurutalagala. Fl. August; purple, and the whole plant usually more or less tinged with that colour.

Also on S. Indian Mts.

7. **L. atropurpurea,** *Lindl. Gen. and Sp. Orch.* 28 (1830).
Thw. Enum. 295. Ridley, l. c. xxii. 277. C. P. 3181.
Fl. B. Ind. v. 698. Bot. Mag. t. 5529. Wight, Ic. t. 903 (*L. olivacea*) and t. 905 (*L. Walkeriæ*).

Stem 6–8 in., stout, base hardly swollen; l. 3–4, petioled, 3–4 in. long, ovate or orbicular, membranous, 5-veined, base very unequal-sided, often cordate, one side acute the other rounded or auricled, margins smooth or crisped; petiole $\frac{3}{4}$–1 in.; ped. slender, with lax-fld. raceme 4–8 in., bracteate or naked; pedicel with ovary $\frac{1}{2}$–$\frac{2}{3}$ in., as long or longer than the lanceolate spreading bracts; fl. nearly 1 in. across the sep.; sep. very long, linear, obtuse, all with recurved sides, dorsal longest, 3-veined, lateral 5-veined, spreading; pet. narrowly linear, spreading; lip orbicular-obovate, fleshy, recurved from the middle, with 2 large long confluent tubercles on the narrow base, margins crenulate; column very slender, curved, wings small, rounded.

Montane zone to 6000 ft.; rather rare. Ambagamuwa; Ramboda; N. Eliya. Fl. July, August; whole infl. a uniform dull red-purple.

Also on Pulney Hills, S. India.

8. **L. brachyglottis,** *Rchb. f. in Trim. Syst. Cat. Ceyl.* 87 (1885). Ridley, l. c. xxii. 275. C. P. 4002.
Fl. B. Ind. v. 699.

Stem 2–3 in., rather slender, swollen at the base; l. 1–2, $1\frac{1}{2}$–$2\frac{1}{2}$ in., sessile or the lower petioled, ovate or ovate-cordate, acuminate, membranous, 5-veined, base equal-sided, rounded or subcordate, margins crisped; ped. short, slender, with the lax-fld. raceme 2–3 in.; bracts ovate, acute, shorter than the slender short pedicels and ovary, concave, spreading; fl. about $\frac{1}{6}$ in. broad; sep. oblong, obtuse, 3-veined, lateral placed under the lip, broadly ovate-oblong, dorsal much longer, margins recurved, pet. linear, spreading, margins recurved; lip shorter than the sep., recurved, transversely oblong, obtuse or retuse or emarginate, base cordate, with a short broad emarginate callus; column short, stout, erect.

Montane zone; very rare. Knuckles Hills; Wattakelle Hill. Fl. Sept.; a very small species with small purple fls.
Endemic.

9. **L. obscura,** *Hk. f. in Hook. Ic. Pl.* t. 1886 (1889).
L. angustifolia, Thw. Enum. 296 (non Lindl.). *L. cæspitosa*, Ridl. l. c. xxii. 290 (non Lindl.). C. P. 2351.
Fl. B. Ind. v. 701. Hook. Ic. Pl. l. c.

Pseudobulbs short, ovoid, or longer, up to 1 in., and cylindric, loosely sheathed; l. solitary or few, articulate on the pseudobulb, 3–4 in., petioled, narrowly oblanceolate, subacute or mucronate, coriaceous, costate; ped. terminal on the pseudobulb, with the lax-many-fld. raceme much shorter than the l., compressed, naked; bracts as long as the pedicel and ovary or longer; fl. very minute, about $\frac{1}{12}$ in. broad; sep. lanceolate, acute, recurved or revolute, 1-veined, margins not recurved; lateral placed under the lip; pet. narrowly linear, deflexed; lip much smaller than the sep., broadly oblong or subquadrate, recurved from the middle, base truncate; column short, suberect, hardly winged.

Moist region 2–5000 ft.; rather rare. Dolosbagie; Hantane; Hanasgiriya. Fl. Jan.; greenish-yellow.
Endemic.

10. **L. longipes,** *Lindl. in Wall. Pl. As. Rar.* i. 31 (1830).
Lindl. Gen. and Sp. Orch. 30. Thw. Enum. 295. Ridl. l. c. xxii. 293. C. P. 3177.
Fl. B. Ind. v. 703. Wight, Ic. t. 906. Ann. Bot. Gard. Calc. viii. t. 37.

Pseudobulbs short and ovoid, or elongate, up to 5 in. and cylindric, clothed with pale sheaths; l. 2, articulate in the pseudobulb, 4–6 in., erect or recurved, linear, oblanceolate or obovate-oblong, obtuse, acute or acuminate, coriaceous, 5–7-veined;

ped. slender, with the terete many and dense-fld. raceme 6–10 in.; bracts small, lanceolate, acuminate, shorter than the pedicel and ovary, a few lower empty; fl. small, about ¼ in. broad; sep. lanceolate, acute or obtuse, 1-veined, at length revolute, lateral spreading; pet. shorter, narrowly linear, margins recurved; lip much shorter than the sep., broadly ovate, deflexed from the middle, subacute or apiculate, margins at the base thickened and fleshy, calli 0; column incurved, wings small, rounded.

Moist low country to 3000 ft.; rather common. Fl. Oct.–Dec.; greenish-white.

S. India, E. Bengal, Burma, Malaya, Pacific Is., China.

11. **L. viridiflora,** *Lindl. Gen. and Sp. Orch.* 31 (1830).

Thw. Enum. 295. Ridl. l. c. xxii. 289. C. P. 3178.

Fl. B. Ind. v. 704. Wight, Ic. t. 1735 (*L. elliptica*). Ann. Bot. Gard. Calcutt. viii. t. 47.

Pseudobulbs about 1 in., ovoid or oblong, compressed, naked; l. 2, jointed on the pseudobulb, sessile or petioled, ¾–1 in., oval or oblanceolate, acute, thin, many-veined; ped. with the long curved or pendulous raceme 4–6 in., with scattered filiform-membranous bracts below the many-fld., elongate raceme; fl. ⅛ in., subsecund, erect or ascending from the at length decurved pedicels; bracts shorter than the pedicels; sep. broadly oblong-lanceolate, flat, acute or subobtuse, 1-veined, spreading; pet. narrowly linear, acute; lip 1-veined, orbicular-ovate, subacute, deflexed from the base, very obscurely 3-lobed, concave, rather fleshy, margins crisped, calli 0; column incurved, not winged; fr. ⅙ in., pyriform, pedicel shorter, spreading.

Montane zone, 3–6000 ft.; rather common. Ambagamuwa; Ramboda; Hantane. Fl. Nov., Dec.; green.

Himalaya and Nilgiri Mts., Java.

12. **L. disticha,** *Lindl. in Bot. Reg.* sub t. 882 (1825).

L. gregaria, Lindl. Gen. and Sp. Orch. 33; Thw. Enum. 296. Ridl. l. c. xxii. 292.

Fl. B. Ind. v. 706. Thouars, Orch. Ins. Afr. t. 89 (*Malaxis disticha*).

Rootstock long, rather slender, creeping and rooting; pseudobulbs terminal, ½–¾ in., pyriform, compressed, clothed with papery sheaths; l. solitary, erect, 4–6 in., linear, acute, coriaceous; ped. with raceme 6–12 in., stout, 2-winged, naked; bracts distichous, imbricate, equitant, ovate, acuminate, keeled, very coriaceous, rhachis of raceme flattened; fl. about ⅓ in., long, few expanding at a time, spreading or deflexed; sep. ovate-oblong, acute, 3-veined, reflexed; pet. linear-spathulate, obtuse; lip fleshy, tongue-shaped, acute, twice reflexed at

right angles, with two thickened prominences at each flexure; column short, broad, erect, broadly winged; fr. ⅓ in., ellipsoid, smooth, ribs slender, pedicel as long.

On trees; montane zone 4–7000 ft.; rather common. Hantane; Hakgala; below Horton Plains abundant. Fl. July, Sept., Oct.; dull yellow or orange, simulating a fly or bug, the pet. being the antennæ.

Burma, Malay Is., Mauritius, Bourbon; not in Peninsular India.

There is a specimen from Moon, dated 1819, in Mus. Brit. (n. 467), but it is not included in Moon's Cat. as quoted in Fl. B. Ind.

L. tristis, Loddiges, cultivated by Loddiges, and said to be from Ceylon in his Cat., p. 4, is a name only.

4. **DENDROBIUM,** *Swartz.*

Epiphytes; stem pseudobulbous or elongate and slender; l. never plaited; fl. solitary or racemose; sep. subequal, lateral obliquely adnate to the foot of the column, and forming with it a sac or mentum; pet. broader or narrower than the sep.; lip very various, adnate to and incumbent on the foot of the column, concave or saccate, rarely flat or convex, side lobes embracing the column, disk usually ridged or lamellate; column very short, foot long or short, top truncate, angled, or 2-toothed; anth. 2-celled, pollinia 4, oblong, waxy, collateral in pairs in each cell, free or pairs slightly adhering by a viscus.—Sp. about 300; 168 in *Fl. B. Ind.*

The Indian species have been classed under twelve sections, only four of which are represented in Ceylon; which island possesses only two of the fine flowering species so much cultivated in Europe, namely, *D. Macarthiæ* and *D. heterocarpum.*

Fl. 1–3, pedicelled on the top of a 1-leaved
  pseudobulb . . . . 1. D. MACRÆI.
Fl. racemose (solitary in *D. crumenatum*).
 Stem a very small 2–3-leaved pseudobulb.
  Mentum long, spur-like . . . . 2. D. PANDURATUM.
  Mentum short, stout, incurved . . 3. D. DIODON.
 Stem elongate.
  Pet. not broader than the sep.
   Fl. solitary at the nodes of the stem 4. D. CRUMENATUM.
   Fl. racemose.
    Lip linear-oblong . . . . 5. D. NUTANS.
    Lip broadly ovate . . . . 6. D. MACROSTACHYUM.
  Pet. broader than the sep.
   Stem slender.
    Lip tongue-shaped . . . . 7. D. HÆMOGLOSSUM
    Lip subspathulate . . . . 8. D. MACARTHIÆ.
   Stem stout, subclavate . . . 9. D. HETEROCARPUM

1. **D. Macræi,** *Lindl. Gen. and Sp. Orch.* 75 (1830). **Jata-makuta,** *S.*
Lindl. in Journ. Linn. Soc. iii. 6. Thw. Enum. 296. C. P. 3695.
Fl. B. Ind. v. 714. Rchb. f. Xenia Orch. ii. t. 118 (*D. flabellatum*) (poor). Ann. Bot. Gard. Calcutt. viii. t. 86.

Rootstock creeping, annulate, giving off pendulous stems 2–3 ft. long, bearing a few lateral and terminal fusiform pseudobulbs 2–2½ in. long; internodes long, terete, smooth; l. solitary, 4–8 in., sessile, linear-oblong or lanceolate, obtuse; fl. 1–3, shortly pedicelled on the top of the pseudobulb, ¾–1 in. long; sep. and pet. erecto-patent or recurved; sep. oblong-lanceolate, subacute; mentum short, conic; pet. linear-oblong, obtuse; side lobes of lip oblong, obtuse, mid lobe almost clawed, recurved, claw crenulate, crisped, terminating in a sub-quadrate 2-lobed limb with 2 fleshy crests.

Rocky places; rare. Near Badulla; summit of Ritigala, N. C. Prov. (2500 ft.), abundant. Macrae's original locality is Peradeniya, and Thwaites says 'not uncommon in the Central Prov.;' but there are no specimens in Herb. Perad. from either. Fl. August; white, with the lip and mentum yellow.

Himalaya and Nilgiri Mts., Java,

As figured in the Annals of the Calcutta Gardens, from Sikkim specimens, the side lobes of the lip are pale pink speckled with red, the terminal lobes primrose yellow.

2. **D. panduratum,** *Lindl. in Journ. Linn. Soc.* iii. 19 (1859).
Thw. Enum. 298. C. P. 2353.
Fl. B. Ind. v. 717.

Dwarf; stems tufted, 2–4 in., formed of superposed, short, ovoid or subglobose pseudobulbs ⅓–½ in. long; l. distichous from the upper nodes, sessile, 1–1½ in., linear-oblong or lanceolate, acute or acuminate, spreading, thinly coriaceous, strongly veined when dry; ped. terminal, capillary, erect, with the laxly 2–6-fld. raceme 1–3 in.; bracts minute, ovate; pedicel with ov. ⅛ in.; sep. ⅓–½ in., dorsal oblong-lanceolate, acuminate, 3-veined, lateral falcately ovate-lanceolate, acuminate, 5-veined; mentum nearly as long as the sep., stout, spur-like, straight or slightly incurved, tip 2-lobed; pet. narrowly oblanceolate, acute, 3-veined; lip ⅓ longer than the sep., panduriform, side lobes small, acute, mid lobe broadly ovate or orbicular, crenulate, disk between side lobes with 5 strong veins, the outer branching, mid lobe reticulate with 3 strong branching veins.

Montane zone 3-6000 ft.; rather common. Ambagamuwa; Galboda; Hantane; Ramboda; N. Eliya; Hakgala. Fl. July–Oct.; white, and base of sep. and lip often stained with pink.

Endemic.

A good drawing of this species in Herb. Peraden. enables me to correct the description of the lip given in Fl. B. Ind.

3. **D. diodon,** *Rchb. f. in Linnæa*, xli. 89 (1877).
D. albidulum, Thw. ex Trim. in Journ. Bot. xxiii. 243. C. P. 3879.
Fl. B. Ind. v. 717.

Dwarf; pseudobulbs crowded on a slender rootstock, ovoid or oblong, $\frac{1}{6}$–$\frac{1}{4}$ in. long, clothed with a hyaline sheath, roots filiform; l. 2–4, sessile, 1–1$\frac{1}{2}$ in. long, linear or oblong, obtuse, acute, or unequally notched, thinly coriaceous, many-veined when dry, base narrowed, mid rib prominent beneath; ped. from the top of the pseudobulb, capillary, with the few.-fld. raceme 1–1$\frac{1}{2}$ in.; bracts small, ovate, acuminate, pedicel with minute ov. $\frac{1}{5}$ in.; sep. $\frac{1}{4}$–$\frac{1}{3}$ in., dorsal linear-oblong, subacute, 3-veined, lateral subfalcately ovate-oblong, acute, 5-veined, mid rib strong; mentum large, $\frac{1}{3}$ the length of sep., stout, incurved, tip rounded, notched; pet. shorter and narrower than the dorsal sep., 3-veined; lip $\frac{1}{3}$ shorter than the sep., cuneately flabelliform or rhomboid, side lobes small, acute, incurved, mid lobe hardly longer than the side lobes, orbicular, concave, margins crisped and deeply toothed, veins reticulate, disk with a strong ridge from the base to the base of the mid lobe, ending in a 3-toothed callus; column short, top 3-toothed, anth. orbicular; fr. subglobose, $\frac{1}{4}$ in. diam., quite smooth.

Montane zone; rather rare. Hakgala, abundant; Hantane; Dumbangala, Rangala. Fl. July–October; sep. and pet. pure white, lip pale green, dotted with claret.

Endemic.

Very similar in infl. to *D. panduratum*, but the habit is different, the fl. are much smaller, the sep. broader and more obtuse, the mentum broad and incurved, the mid lobe of the lip toothed on the margin, and the callus on the disk 3-toothed.

4. **D. crumenatum,** *Swartz in Schrad. Journ.* ii. 237 (1799).
Sudupareyi-mal, *S.*
Moon, Cat. 60. Thw. Enum. 297. C. P. 3696.
Fl. B. Ind. v. 729. Bot. Reg. xxv. t. 22. Bot. Mag. t. 4013.

Stems tufted, elongate, 2–3 ft., rigid, simple or branched, internodes 1 in. or shorter, terete, lower 3 or 4 together, forming a fusiform elongated pseudobulb 2 in. long; l. many, 2–3 in. long, distichous, linear-oblong, obtuse or notched, coriaceous; fl. 1–1$\frac{1}{4}$ in. long, solitary at the internodes of the long slender leafless top of the stem, ped. with ov. $\frac{1}{2}$ in.; bracts much shorter; fl. 1 in. long; sep. erecto-patent, ovate-lanceolate, acuminate, 7-veined; mentum as long as the sep., conical, acute, incurved; pet. linear-oblong, acuminate, 5-veined; side lobes of lip narrow, mid lobe much larger, suborbicular, crisped, disk with crenulate ridges.

On tree-trunks, principally cocoanuts, on the coast in the moist region; common, but not improbably originally introduced from Malaya. Fl. Dec.; pure white, with the disk of the lip lemon-yellow.

Burma, Andaman Is., Malaya, China.

The 'White-dove Orchid' of the English residents; much grown for its pretty and sweet-scented flowers.

5. **D. nutans,** *Lindl. Gen. and Sp. Orch.* 90 (1830).
Thw. Enum. 298. C. P. 2357.
Fl. B. Ind. v. 734. Ann. Bot. Gard. Calcutt. v. t. 18.

Stem very slender, 6–12 in., as thick as a goose quill or less, internodes $\frac{2}{3}$–1 in., rather swollen in the middle, slender at the base, 4-channelled, hispidulous with black hairs; l. 1$\frac{1}{2}$–2 in., narrowly lanceolate, obtuse or shortly unequally bifid, stiff; fl. about $\frac{2}{3}$ in. long, in short leaf-opposed 2–4-fld. racemes, pedicel with ov. $\frac{3}{4}$ in.; bracts very small, ovate, acute; sep. and pet. subequal, erect, linear-lanceolate, acuminate; mentum half as long as the sep., obtuse; lip. linear-oblong, under $\frac{1}{4}$ in. long, side lobes small, obtuse, mid lobe elongate, oblong-lanceolate, subacute, crisped, with three ridges on the disk; fr. $\frac{1}{2}$–$\frac{3}{4}$ in., pedicel decurved, smooth.

Montane zone, 4–6000 ft.; rather common. Hantane; Ambagamuwa; N. Eliya. Fl. Nov.–March, May; varies greatly in colour of flowers, which are orange, dull yellow, pale pink, or greenish-white; or white with a pink lip and yellow pedicel, which is the prettiest form.

Also in Southern India. *D. Jerdonianum*, Wight, Ic. t. 1644, of the Nilgiris can hardly be distinguished, except by its more robust habit, deeper cleft l., and much larger fl.

6. **D. macrostachyum,** *Lindl. Gen. and Sp. Orch.* 78 (1830).
Thw. Enum. 297. C. P. 3183.
Fl. B. Ind. v. 735. Wight, Ic. t. 1647.

Stems many, crowded, very slender, leafing 1–2 ft. long, flg. up to 4 ft., pendulous, leafless internodes 1$\frac{1}{2}$ in.; l. sessile, 3–3$\frac{1}{2}$ in. long, distichous, spreading, oblong or oblong-lanceolate, acute, membranous; sheaths closely appressed to the stem; fl. 2–4, on a short curved ped., pedicel with ov. about 1 in., slender, curved; bracts very small, ovate; sep. and pet. subsimilar, about $\frac{1}{2}$ in long, oblong-lanceolate, acute, subtortuously spreading and recurved; mentum narrowly funnel-shaped, about half as long as the sep., obtuse; lip shorter than the sep., side lobes small, rounded, convolute, mid lobe quadrately ovate, acute, recurved, crenulate, strongly veined.

Moist region up to 4000 ft.; common. Fl. June, July; very pale green or yellow, tinged with pink, lip beautifully veined with pink; faintly scented.

Also in Travancore.

7. **D. hæmoglossum,** *Thw. Enum.* 429 (1864). C. P. 3842.
Fl. B. Ind. v. 727.

Rootstock woody, nodose, with long vermiform roots; stem 12–18 in., pendulous, as thick as a crowquill, hard, slender, naked or clothed below with old leaf-sheaths, leafy above, base sometimes swollen and obpyriform, internodes $\frac{3}{4}$–$1\frac{1}{4}$ in.; l. distichous, sessile, 3–5 by about $\frac{1}{3}$ in., linear, rigidly papery, striate, with 5 stronger and many slender veins, tip obtuse, slightly incurved, sheaths tight, striate; fl. 2–4 on leaf-opposed tubercles that burst through the sheath much below its mouth; pedicel with ov. $\frac{1}{2}$ in.; bract at the base of the pedicel cupular; sep. about $\frac{1}{2}$ in. long, connivent with recurved tips, dorsal oblong, lateral ovate-oblong, apiculate; mentum short, rounded at the tip, incurved; pet. as long as the sep., linear-oblong; lip tongue-shaped, quite entire, acute, glabrous, undulate; fr. $\frac{3}{4}$ in. long, oblong, narrowed at both ends, pedicel half as long.

Montane zone; rare. Matale (Gardner); Dolosbagie; Knuckles Hills. Fl. July (?); yellow, the lip tinged with dark red.

Also in Malabar.

8. **D. Macarthiæ,*** *Thw. in Bot. Mag.* t. 4886 (1855). **Wesak-mal,** *S.*

Thw. Enum. 297. Veitch, Man. Dendrob. 57. C. P. 3462.
Fl. B. Ind. v. 736. Veitch, l. c. 58. Warner, Orch. Alb. vii. t. 319.

Stems 1–2 ft., tufted on a densely rooting rootstock, slender, terete, pendulous, base tuberous, internodes $1\frac{1}{2}$–2 in.; l. $2\frac{1}{2}$–4 in., lanceolate, acuminate, membranous; sheaths appressed, green, mottled with brown; racemes 2–4 in., leaf-opposed, laxly 2–4-fld.; ped. stout, with short, obtuse, imbricate basal sheaths; bracts $\frac{1}{4}$–$\frac{1}{2}$ in., lanceolate, brown; pedicel with ov. $\frac{1}{2}$ in. or less, curved; fl. $2\frac{1}{2}$–3 in. long; sep. erect, lanceolate, acuminate; mentum short, conical, straight; pet. broader and rather shorter, ovate-oblong, acuminate; tip rounded; lip subpathulate, side lobes rounded, convolute, mid lobe broadly ovate, cuspidate.

Forests in the moist region below 2000 ft.; rare. Ambagamuwa: Sabaragamuwa Prov. in many places; Hewesse. Fl. May–July, during the heavy south-west rains; clear violet-pink, the lip paler but veined and bordered with deep pink and with a large purple blotch on the disk; rarely all white, with a faint purple stain on lip.

Endemic.

Certainly the handsomest of Ceylon Orchids, and of late years so much collected for export as to have become very scarce in places which formerly produced abundance. The Sinhalese name means 'May-flower,' from its time of flowering.

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* Named in honour of Mrs. (afterwards Lady) MacCarthy, wife of C. J. MacCarthy, Colonial Secretary (afterwards Governor, as Sir J. C.), of Ceylon.

9. **D. heterocarpum,** *Wall. Cat. n.* 20 (1828).

D. aureum, Lindl. Gen. and Sp. Orch. 77; Thw. Enum. 297; Veitch, Man. Dendrob. 19 C. P. 574.

Fl. B. Ind. v. 737. Wight, Ic. t. 1646. Bot. Mag. t. 4708. Bot. Reg. 1839, t. 20 (var. *pallidum*, Lindl.). Ann. Bot. Gard. Calcutt. viii. t. 74.

Stems 9–18 in., tufted, elongate, subclavate, green, constricted at the nodes, internodes 1 in. or shorter, shallowly many-ribbed, thickest $\frac{1}{2}$–$1\frac{1}{2}$ in. diam., terete, leafless when flg.; l. 4–5 in., oblong-lanceolate, flat, subcoriaceous, tip oblique, subacute or emarginate; fl. 2–3 on a very stout short ped., 2–$2\frac{1}{2}$ in. diam.; pedicel with ov. about 1 in., very stout, bracts very short, tubular; sep. spreading and recurved, dorsal linear-oblong, obtuse; lateral broader, oblong, acute or apiculate; mentum short, broad, truncate; pet. broader than the sep., ovate-oblong, acuminate; lip as long as the sep., base short, convolute, expanding into a large ovate, acute, obscurely 3-lobed, recurved limb, side lobes of limb rounded, margins waved, disk pubescent.

Upper montane zone above 6000 ft.; common. Fl. Jan.–April; pale or dull primrose yellow, the lip with two orange-purple blotches on the disk; or all orange-coloured but the apex; or (in var. *pallidum*) nearly white, with the blotches pale orange.

Himalaya, Khasia, and Nilgiri Mts., Burma, Java, Philippine Is.

The so-called 'Primrose Orchid' of Nuwara Eliya, from the sweet faint scent and colour of the flowers. The name, *heterocarpum*, seems to have no application to this species, but has two years' priority over *aureum*.

D. criniferum, Lindl. in Bot. Reg. 1844, Misc. 41, was described from cultivated plants 'received from Mr. Power in Ceylon.' It is cultivated in Peradenyia Gardens, but is not a Ceylon plant.

D. lamellatum, Lindl. (*D. compressum*, Lindl. in Bot. Reg. 1844, t. 53), was sent, in 1840, to Sion House by Mr. Nightingale from Ceylon. If collected here, it must have been as a cultivated plant; it is a native of Burma and Borneo.

D. sanguinolentum, Lindl. in Bot. Reg. 1843, t. 6, was sent from Ceylon by Mr. Nightingale, and fld. at Sion House. It is a native of Penang, cultivated at Peradenyia.

5. BULBOPHYLLUM, *Thouars.*

Pseudobulbs on a creeping rootstock, 1-3-leaved; scape from the base of the pseudobulb; fl. solitary, spicate, racemose, or umbelled; sep. subequal, or the dorsal rather shorter, lateral adnate to the foot of the column, forming with it a mentum; pet. various, usually very small; lip jointed at the foot of the column and mobile, small, entire, usually coriaceous or fleshy, strongly recurved; column very short, its base produced into a long upcurved foot; anther terminal, 2-celled; pollinia 4,

waxy, collateral, cohering in pairs by a viscus, ovoid or oblong, 2 inner smaller.—Sp. about 130; 86 in *Fl. B. Ind.*

Lateral sepals flat or nearly so; fl. small.
  Flowers solitary . . . . 1. B. CRASSIFOLIUM.
  Flowers fascicled on the top of the scape . . 2. B. PETIOLARE.
  Flowers spicate . . . . 3. B. PURPUREUM.
Lateral sepals concave; fl. large . . . . . 4. B. ELEGANS.

1. **B. crassifolium,** *Thw. ex Trim. in Journ. Bot.* xxiii. 244 (1885).
C. P. 3879.
Fl. B. Ind. v. 770.

Dwarf; pseudobulbs pisiform, $\frac{1}{3}$–$\frac{3}{4}$ in. diam., smooth, crowded on a stiff slender rootstock bearing numerous branched flexuous filiform roots, 1-leaved, 1-fld.; l. $\frac{1}{2}$–$\frac{3}{4}$ in., sessile, oval or suborbicular, thickly coriaceous, channelled down the centre, margins thickened when dry; fl. solitary, very small, about $\frac{1}{3}$ in. broad; pedicel with ov. $\frac{1}{4}$ in., sheathed at the base by a short truncate bract; sep. subequal, broadly ovate, dorsal arched, erect, lateral spreading; pet. minute, broad, truncate; lip minute, tongue-shaped, obtuse.

Moist low country; very rare. Kukul Korale (Thwaites). Fl. Sept.; minute yellowish-green, punctate with red, lip white.
Endemic.

2. **B. petiolare,** *Thw. Enum.* 298 (1861).
C. P. 3184.
Fl. B. Ind. v. 759.

Pseudobulbs very small, pisiform, $\frac{1}{10}$–$\frac{1}{4}$ in. diam., crowded on a slender rootstock with long filiform roots; l. petioled, 1–2 in., from linear-oblong 2 in. long to much shorter, obovate or oblanceolate or shortly oblong, thickly coriaceous, tip subacute, notched or rounded, margins thickened when dry; petiole $\frac{1}{2}$–$1\frac{1}{4}$ in., slender; ped. 2–3 in., very slender, erect, 4–5-fld., with one small subulate bract about the middle; fl. about $\frac{1}{3}$ in. long, fascicled at the top of the ped., pedicel and ov. very short; bracts minute; sep. lanceolate, acute, dorsal longest, lateral connivent, free; mentum rounded; pet. $\frac{1}{4}$ the length of the sep., ovate, obtuse; lip broadly tongue-shaped, obscurely 3-lobed, obtuse, convex, recurved, deeply channelled down the middle; anth. with 2 tubercles, pollinia subglobose, one of each pair very small; fr. $\frac{1}{3}$ in. long.

Moist low country; very rare. Ambagamuwa; Singhe Raja Forest. Fl. Aug., Nov., Dec.; orange or pinkish, strongly veined with red, lip red.
Endemic.

3. **B. purpureum,** *Thw. Enum.* 298 (1861).
C. P. 3697.
Fl. B. Ind. v. 768.

Dwarf; pseudobulbs fusiform or ovoid, $\frac{1}{4}$ in. long, densely crowded on a slender rootstock with filiform branched roots; l. $\frac{1}{2}$–$1\frac{1}{2}$ in., obovate or spathulate, tip retuse or notched, base narrowed into a petiole $\frac{1}{6}$ in. long, coriaceous; ped. shorter than the l., filiform, naked, spike $\frac{1}{2}$–$\frac{2}{3}$ in., dense fld.; bracts very minute, triangular; pedicels deflexed, with the ov. $\frac{1}{12}$ in.; fl. erect, about $\frac{1}{6}$ in. long; sep. erecto-patent, dorsal ovate-lanceolate, obtuse, hooded, lateral oblong-ovate, strongly 3-veined, cohering, and together forming an obtuse notched recurved limb with recurved margins; mentum rounded; pet. half as long as the sep., linear-oblong, obtuse; lip one-third shorter than the sep., obscurely 3-lobed, reflexed; column with 2 short arms.

Moist region extending into montane zone; very rare. Ambagamuwa; Wattakelle; Hantane. Fl. Jan.; pink or purplish, with darker veins.
Endemic.

4. **B. elegans,** *Gardn. in Thw. Enum.* 298 (1861). [PLATE LXXXVIII.]
C. P. 2350.
Fl. B. Ind. v. 770.

Pseudobulbs ovoid, $\frac{1}{3}$–$\frac{1}{2}$ in. long, closely set on a slender rootstock with branched fibrous roots; l. 3–4 in., linear or linear-oblong or -lanceolate, obtuse, coriaceous, deeply grooved down the centre, sessile or base narrowed into a very short petiole; ped. 1–2 in., very slender, decurved, 1–2-fld., naked; fl. large, 1–$1\frac{1}{2}$ in. long, pendulous; ov. with very slender pedicel $\frac{3}{4}$–1 in.; bracts $\frac{1}{4}$ in., lanceolate, red-brown; dorsal sep. broadly ovate, acute, hooded, lateral longer, oblong-lanceolate, acuminate, very concave, free or cohering in a cymbiform blade; mentum obscure; pet. minute, lanceolate; lip half as long as the lateral sep., narrowly tongue-shaped, obtuse, very fleshy, with two small basal incurved lobes; column rather long, arms subulate, erect; anth. longer than broad, pollinia 4, subpyriform, those of each pair closely appressed; fr. $\frac{1}{2}$ in., narrowly ellipsoid, rather longer than its pedicel.

Montane zone 3–6000 ft.; rather rare. Ambagamuwa; Hantane, abundant; Maskeliya. Fl. Feb.–May; dull purple tinged with green, lip orange with purple dots.

Endemic. A singular plant, not without beauty.

This species is placed in the section *Ione* in the Fl. Brit. Ind., the pollinia being then unknown to me. The true Iones have (fid. Ann. Bot. Gard. Calcutt. viii. 157) two pairs of pollinia, each pair attached by a strap to a gland, and hence belong to *Vandeæ*.

6. CIRRHOPETALUM, *Lindl.*

Characters of *Bulbophyllum*, but lateral sepals more than twice as long as the dorsal.—Sp. about 50; 36 in *Fl. B. Ind.*

Cirrhopetalum is by general consent kept separate from *Bulbophyllum*, although resting on only one, and this an artificial and variable character. This is a matter of convenience; each having a great many species described under it, the confusion arising from uniting them would be great, and lead to involved synonymy.

Dorsal sep. and pet. ciliate . . . . . . 1. C. GRANDIFLORUM.
Dorsal sep. and pet. glabrous.
  Lateral sep. parallel.
    Lateral sep. under 1 in. long.
      Lateral sep. 5-nerved . . . . . 2. C. WIGHTII.
      Lateral sep. 1-nerved . . . . . 3. C. TRIMENI.
    Lateral sep. over 1 in. long . . . . . 4. C. MACRÆI.
Lateral sep. divergent . . . . 5. C. THWAITESII.

1. **C. grandiflorum,** *Wight, Ic.* v. 1, 7 (1851).

Thw. Enum. 299. *Bulbophyllum Wightii*, Rchb. f. in Walp. Ann. vi. 262. C. P. 3657.

Fl. B. Ind. v. 773. Wight, Ic. t. 1656.

Rootstock stout, internodes long or short, giving off slender vermiform roots, and covered with old brown l. sheaths; pseudobulbs about 1 in., ovoid-oblong, ribbed, green, clothed with broad brown papery sheaths; l. 2½–5 by ¾–1 in., linear-oblong, emarginate, base narrowed into a short petiole, thickly coriaceous, ecostate and veinless, dark green; ped. 6–8 in., rather stout, spotted with red, 2–4-fld., with 2 short distinct sheaths besides the basal; fl. subumbelled, 2 in. long; bracts ¼–⅓ in., lanceolate, scarious; pedicel with ov. 1 in.; dorsal sepal nearly 1 in., ovate, acuminate, galeate, sparsely ciliate, lateral about 2¼ in., parallel, free or coherent, linear-oblong, obtuse, 5-veined; pet. about ½ in., linear-lanceolate from a broad base, copiously ciliate with long hairs; lip tongue-shaped, obtuse; column broad, 2-winged, wings bifid or 2-toothed at the top; fr. 1½ in., narrowly pyriform, pedicel ½ in., much thickened, decurved.

Montane zone 3–6000; rather rare. Maturata; N. Eliya; Hantane; Dimbula (W. Smith); Hakgala. Fl. Feb.–April; sepals and petals yellow, veined and spotted with red; lip purple.

Endemic. A beautiful and curious species; the very long lat. sep. are often connected by their extremities or for a considerable distance.

2. **C. Wightii,** *Thw. Enum.* 299 (1861) (part).

Reichb. f. in Journ. Bot. xii. 198. *C. Elliæ*, Trim. Cat. 88. *C. Macræi*, Wight, Ic. v. I. 7 (non Lindl.). *Bulbophyllum Elliæ*, Rchb. f. in Walp. Ann. vi. 263. C. P. 3160.

Fl. B. Ind. v. 776. Wight, Ic. t. 1652 (*C. Macræi*).

Rootstock flexuous, as thick as a crow-quill, internodes ¼ in. long, with long flexuous roots; pseudobulbs ovoid,

½–⅔ in. long, naked; l. 1½–3½ in., shortly petioled, oval and 1–2 in. long, or linear-oblong and 3–5 inch long, thickly coriaceous, tip emarginate, veins obscure; ped. rather stout, shorter or longer than the l., 6–8-fld., green speckled with red, sheaths 2–3, distant, lanceolate; fl. subumbellate, bracts $\frac{1}{10}$ in., subulate-lanceolate; pedicel with ov. ½ in., green speckled with red, as are the margins of the sep.; dorsal sep. broadly ovate, obtuse, 5-nerved, lateral 2–3 in. long, three times as long as the dorsal, parallel, linear-oblong, subacute, convex, 5-nerved; petals ovate, acute, erose, 3-nerved; lip very small, linear-oblong, obtuse, strongly recurved; columnar teeth very short.

Montane zone 4–7000 ft.; rather common. Hantane; N. Eliya; Hakgala; Horton Plains. I have also collected it at Veddagalle in Singhe Raja Forest at not more than 1500 ft. Fl. March–May, September; greenish-yellow, with minute crimson lines or dots, which also cover the inflorescence.

Endemic.

3. **C. Trimeni,** *Hook. f.*

Rootstock much branched, internodes short; pseudobulbs globose-ovoid; l. ¾–1 in., oblong or oval-oblong, obtuse, emarginate, thickly coriaceous, stiff; ped. 1½ in., very slender, spotted with red; umbel 6-fld., bracts short, acute; fl. about ½ in. long.; dorsal sepal under ¼ in., ovate-oblong, shortly acuminate, lateral under ½ in., lanceolate, acute, parallel, 1-veined; pet. ⅛ in., oval-oblong, obtuse, apiculate, sub-erose; lip tongue-shaped, thick, obtuse, strongly upcurved. —*Trimen MSS.*

Hagkalle, creeping on trunks of trees, 18th Sept. 1894 (Trimen).

Fl. Sept.; straw-coloured, lip darker.

Endemic.

All the above is from a MS. of Dr. Trimen. I find no specimen in the Perad. Herb., nor any figure amongst the drawings.

4. **C. Macræi,** *Lindl. Gen. and Sp. Orch.* 59 (1830).

C. Walkerianum, Wight, Ic. v. 1, 7. Thw. Enum. 299. C. P. 2362.

Fl. B. Ind. v. 780. Wight, Ic. t. 1657 (C. Walkerianum). Bot. Mag. t. 4422.

Rootstock stout, creeping, with filiform roots; pseudobulbs ¾ in., crowded, ovoid or lageniform, smooth, surrounded by the bristling remains of old sheaths; l. 3–5 by 1–1¼ in., petioled, ovate-oblong to linear, obtuse, tip entire, very coriaceous; petiole 1–1¼ in.; ped. 6 in. long, very slender, with 2–3 slender appressed bracts, green; fl. very shortly racemed, 1½–2 in. long; pedicels and ov. ¼ in.; bracts ⅛ in., lanceolate; dorsal sep. lanceolate, acuminate, 3-veined, decurved, lateral, three times as long as the dorsal, or longer, parallel, narrowly linear-lanceolate, narrowed into slender tips, 5-veined, free or

cohering; pet. falcately ovate-lanceolate, apiculate, 3-veined; lip very small, strongly recurved, tongue-shaped, obtuse; columnar arms widely spreading, long, broad, crenate on one side; pollinia pyriform.

Lower montane zone 3-4500 ft.; rather common. Hantane; Hewahette; Pundaloya; also on summit of Ritigala, N. C. Prov. (2500 ft.). Fl. July–October; yellow, tinged more or less with brownish-purple; nearly white in the Ritigala plant.

Endemic.

5. **C. Thwaitesii,** Rchb. f. in Journ. Bot. xii. 199 (1874).
C. Wightii, Thw. Enum. 299 (part). Trim. Syst. Cat. Ceyl. 88. C. P. 2740.
Fl. B. Ind. v. 777.

Rootstock rather stout, tortuous, moderately branched, emitting filiform roots, internodes 1½ in. or shorter; pseudobulbs ¼–⅔ in., subglobosely ovoid, at length ridged; l. 1¼–2¼ in., very shortly petioled, oblong to oval- or linear-oblong, obtuse, emarginate, very thickly coriaceous, stiff; ped. 1 or 2, 2–4 in., flexuous, usually spotted or streaked with red, and umbellately 3–6-fld., pedicel with ov. $\frac{4}{10}$ in.; bracts minute, acute; dorsal sep. nearly ⅓ in., broadly ovate, acute, lateral, ⅓–½ in., ovate-lanceolate, subacute, widely spreading, 5-veined; pet. very small, ovate, subacute, quite entire; lip tongue-shaped, fleshy, channelled; fr. pyriform, ⅔ in., strongly ribbed, stoutly pedicelled.

Montane zone up to 7000 ft.; rather rare. N. Eliya; Ramboda; Hakgala. Fl. March, August; pale greenish-yellow, without red streaks or spots.

Endemic.

7. CŒLOGYNE, *Lindl.*

Epiphytes; rootstock creeping, bearing 1-few-leaved pseudobulbs; l. coriaceous or membranous and plaited; ped. from the base or top of the pseudobulb; raceme few or many-fld.; fl. medium-sized or small, bracts usually large; sep. subequal, dorsal oblong, lateral ovate-oblong, base more or less saccate; pet. narrower, nearly as long as the sep.; lip sessile on the base of the column, erect, as long as the sep., 3-lobed, lateral lobes embracing the column, disk crested; column long, slender, margined or winged, top dilated, hooded, foot 0; anth. 2-celled or imperfectly 4-celled, pollinia 4, pyriform, waxy, cohering in pairs or all together by a viscus.—Sp. 90 or more; 62 in *Fl. B. Ind.*

Bracts, ⅔–1½ in. . . . . 1. C. BREVISCAPA.
Bracts, ½–⅔ in. . . . . 2. C. ODORATISSIMA.
Bracts, ¼ in. . . . . 3. C. ZEYLANICA.

1. **C. breviscapa,** *Lindl. Fol. Orchid.* Cœl. 4 (1854).
Thw. Enum. 300. C. P. 3121.
Fl. B. Ind. v. 833 (excl. syn.).

Rootstock very stout, as thick as a goose quill, clothed with rigid dark brown appressed scales; pseudobulbs $1\frac{1}{2}$–$2\frac{1}{2}$ in., crowded, 1–2-leaved, narrowly ovoid, sheaths broad, coriaceous, red-brown; l. 3–5 in., linear-oblong, subacute, coriaceous, keeled, narrowed into a short petiole; ped. from the base of the terminal pseudobulb, with the 4–6-fld. raceme 3–4 in. long, slender, basal sheaths closely imbricate, hard, obtuse; fl. distant, $\frac{3}{4}$–1 in. broad, bracts $\frac{2}{3}$–$1\frac{1}{2}$ in., oblong-lanceolate, acute, chartaceous, brown, persistent, pedicels slender, with the ov. $\frac{1}{2}$–$\frac{2}{3}$ in., spreading or decurved; dorsal sep. oblong-lanceolate, acute, lateral ovate-oblong; pet. linear-oblong; side lobes of lip short, obtuse, mid lobe orbicular-obovate, retuse or apiculate, disk with 2 thickened ridges and a median slender one, top of column crenate; fr. $1\frac{1}{4}$ in., narrowly fusiform, acutely angled.

Upper montane zone; rather rare. N. Eliya.
Fl. Dec.–Jan.; white, lip tinged with yellow, bracts brown.
Endemic.

The name *breviscapa* is unfortunate, as the ped. is longer than in the other Ceylon species.

In Fl. Brit. Ind., I (following Thwaites) referred Wight's *C. angustifolia* (Ic. Tab. 1641) to this species, but, now that I have seen the Peradeniya drawings and specimens, I reject this identification. Wight's figure is a bad one, to whatever species it may pertain. There is, in the Kew collection of drawings, one by Mrs. Walker of a variety of this, or of an allied congener, from Ramboda, with pseudobulbs 3 in. long, yellow-flowered, and a 2-lobed mid lobe of the lip.

2. **C. odoratissima,** *Lindl. in Wall. Cat.* n. 1960 (1828). [Plate LXXXIX.]
Lindl. Gen. and Sp. Orch. 41; Fol. Orch. Cœl. 5. Thw. Enum. 300. C. P. 518.
Fl. B. Ind. v. 834. Wight, Ic. t. 1640 (?). Bot. Mag. t. 5462 (?).

Rootstock creeping, with long slender roots; pseudobulbs many, crowded, 1–2-leaved, about 1 in. long, subglobose, obscurely 4-sided, wrinkled when old, sheaths hyaline; l. $2\frac{1}{2}$–4 in., linear-lanceolate, subacute, keeled, thinly coriaceous, punctulate beneath; ped. from the base of an old pseudobulb, erect, shorter than the l., 2–4-fld., basal sheaths closely imbricate, obtuse: raceme lax-fld., bracts $\frac{1}{2}$–$\frac{2}{3}$ in., oval-oblong, acute, membranous, persistent, pedicel with ov. $\frac{1}{2}$–$\frac{3}{4}$ in.; sep. 1–$1\frac{1}{4}$ in., subacute, dorsal oblong-ovate, lateral falcately ovate; pet. narrowly oblong or oblanceolate; side lobes of lip oblong, obtuse, erect, mid lobe orbicular, entire, apiculate,

disk with 3 slender crisped ridges; column margined, hood entire; fr. 1 in., pyriform, or broadly ellipsoid, thickly 6-ribbed, pendulous from the elongated thickened ped.

Upper montane zone; common. Fl. Dec., Jan.; white, with a yellow stain on the lip.

Also on the Nilgiri Mts., S. India.

The name *odoratissima* is scarcely warranted by the very faint scent of the pretty flowers. Neither of the figures quoted, which represent the Nilgiri plant, are characteristic for ours, which has much larger flowers, less acute sep. and pet., and very crowded globose pseudobulbs.

3. **C. zeylanica,** *Hook. f.* (nov sp.)
C. P. 4003.

Rootstock creeping, with slender roots; pseudobulbs 1–2-leaved, $\frac{1}{2}$ in. long, obpyriform or ovoid, somewhat wrinkled, green, bearded at the base with the red-brown fibres of old sheaths; l. 4–6 by $\frac{1}{4}$ in., narrowly linear-lanceolate, acute, keeled, coriaceous, narrowed into a petiole; ped. at the base of an old pseudobulb, much shorter than the l. ($1\frac{1}{2}$ in.), slender, erect, 2-fld., basal sheaths imbricate in a cone, obtuse, green; bracts $\frac{1}{4}$ in., oblong, brown; fl. drooping, sep. $\frac{1}{2}$ in., subacute, dorsal oblong, lateral ovate-oblong; pet. narrowly linear; side lobes of lip broad, obtuse, mid lobe orbicular.

Ambagamuwa district (Ic. Herb. Peradeniya).

Fl. (?) white, with two ochreous spots on the mid lobes of the lip.

A very distinct little species, allied to *C. odoratissima*, but much smaller in all its parts, with ovoid pseudobulbs, very narrow l., very short ped., and small bracts. The description is from an excellent drawing, and a flowerless specimen in the Peraden. Herb. on the same sheet with a specimen ticketed 'C. P. 3121 (?) *C. breviscapa* (?) (D. Morris).'

8. ADRORHIZON, *Hook. f.*

Rootstock creeping, emitting many long stout vermiform roots; pseudobulbs 0, or narrow, 1-leaved; l. narrow, coriaceous; ped. from the base of the stem or pseudobulb, erect, 1–3-fld.; bracts minute; sep. linear-oblong, obtuse; pet. as long, narrowly spathulate, obtuse; lip sessile on the base of the column, erect, spathulate, entire, obtuse; base saccate, tip crenulate, disk smooth; column narrowly winged, top dilated with toothed sides; foot 0; anth. imperfectly 4-celled; pollinia 4, free, waxy, narrowly pyriform, 2 larger than the others; fr. narrowly oblong or pyriform, strongly 6-ribbed.

A. purpurascens, *Hook. f.*
Cœlogyne (?) *purpurascens.* Hk. f. in Fl. B. Ind. v. 842. *Dendrobium purpurascens*, Thw. Enum. 298. C. P. 2352.
Fl. B. Ind. l. c. Hook. Ic. Plant. t. 2110.

Roots 3–4 in. by $\frac{1}{8}$ in. diameter, simple, flexuous, constricted here and there, covered with a loose pale epidermis; stem or pseudobulb $\frac{1}{2}$–$\frac{3}{4}$ in., terete or narrowly ovoid, clothed with membranous reticulate scales; l. erect, 1–4 in., linear-oblong or oblanceolate, acute or obtuse, coriaceous, often purplish beneath, margins recurved when dry; ped. 3–4 in., very slender, with a small sheath about the middle, and several membranous ones at the base; pedicel with ov. $\frac{1}{4}$–$\frac{1}{2}$ in., straight; fl. about $\frac{2}{3}$ in. broad, sep. 3-veined; pet. 1-veined; fr. $\frac{1}{2}$–$\frac{2}{3}$ in.

Montane zone 4–7000 ft.; rather common. Ambagamuwa; Hantane; Nuwara Eliya; Horton Plains. Fl. Sept.-Nov.; pure white, the column and anther-case dark purple; leaves and infl. strongly tinged with purple. Endemic.

I stated in Fl. Brit. Ind. that this little plant should probably form a separate genus from *Cœlogyne*, for which I proposed the name *Adrorhizon*, in allusion to its curious thick roots; but that I awaited more specimens before establishing it. These I have (in the Peradeniya Herb.) now examined, and they confirm my opinion of its proving a very distinct genus, which is nearer to the Himalayan *Panisea*, Lindl. (see Ann. Bot. Gard. Calcutt. v. t. 29) than to any other, differing in the absence of the long sigmoid claw of the lip of that genus.

9. **PHOLIDOTA,** *Lindl.*

Epiphytes, pseudobulbs tufted, 1-2-leaved; l. broad, plaited; ped. terminal on the pseudobulb, elongate, very slender, decurved; fl. small, subglobose, in spiciform drooping racemes, with cymbiform distichous bracts; sep. broad, lateral concave; pet. narrow, flat; lip short, sessile on the base of the column, erect, saccate, shortly lobed; column very short, broad, cucullate, foot 0; anth, 2-celled, pollinia 4, waxy, subglobose, free or cohering in pairs by a viscus.—Sp. about 20; 11 in *Fl. B. Ind.*

P. imbricata, *Lindl. in Hook. Exot. Fl.* ii. t. 138 (1825).
Lindl. Gen. and Sp. Orch. 36. Thw. Enum. 300. C. P. 3187.
Fl. B. Ind. v. 845. Wight, Ic. t. 967. Bot. Reg. t. 1213, 1777.

Pseudobulbs $\frac{1}{2}$–2 in. long, ovoid, sub-tetragonal, smooth, truncate, 1-leaved; l. 6–12 by $1\frac{1}{2}$–2 in., linear or oblong-lanceolate or oblanceolate, obtuse, coriaceous, base tapering, 3–5-costate beneath; ped. 8–10 in., longer than the l., naked, decurved, raceme 4–9 in., very many-fld., bracts $\frac{1}{3}$ in. broad, cuspidate, lowest empty closely imbricating; sep. $\frac{1}{4}$ in. long, dorsal flat, lateral cymbiform, connate at the base, keeled dorsally, keel winged; pet. linear; lip saccate between the side lobes, mid lobe short, broad, bifid, disk 3-veined, median

vein thickened at the base; column orbicular when spread out; fr. $\frac{3}{4}$ in., globose or ellipsoid, strongly ribbed, fruiting rhachis thickened.

Moist region up to 3000 ft.; common. Fl. Aug.; white, with a pinkish or yellowish tinge, bracts brown.

Also in the hilly districts of India, Burma, Andaman Is.

10. CHRYSOGLOSSUM, *Bl.*

Terrestrial herbs, with a creeping rootstock and erect stem, pseudobulbous at the base, 1-leaved, terminating in a lax-fld. raceme; l. petioled, oval, membranous, plaited; fl. rather small; sep. subequal or dorsal narrowest, lateral connate with the short foot of the column, forming with the lip a short mentum; pet. broad or narrow; lip erect, 3-lobed, disk lamellate; column incurved, foot short, margins auricled above the middle; anth. 2-celled, pollinia 2, pyriform, waxy, free.—Sp. 7; 4 in *Fl. B. Ind.*

C. maculatum, *Hk. f. in Fl. B. Ind.* v. 784 (1890).
Ania maculata, Thw. Enum. 301. C. P. 3515.
Fl. B. Ind. v. 784. Hook. Ic. Plant. t. 2064.

Rootstock stout, creeping, with thick vermiform roots; stem a foot high, narrowly pseudobulbous at the base, as thick as a crow-quill above, bearing a few distant tubular sheaths with obliquely truncate mouths; l. 10 by $3\frac{1}{2}$ in., shortly petioled, oval, acute, 7-veined, quite glabrous; raceme 6 in. long, lax-fld.; bracts lanceolate, shorter than the slender pedicels; fl. nearly 1 in. diam.; sep. erect, obtuse, dorsal oblong, lateral larger, spreading and recurved, narrowly oblong, falcate; mentum short, conical, obtuse; pet. as broad as the sep.; lip shorter than the sep., base auricled, side lobes small, oblong, obtuse, mid lobe much longer, orbicular, concave, disk with 3 lamellæ; auricles of column triangular, obtuse; anth. small; fr. $1\frac{1}{4}$ in., oblong-clavate, pendulous from a stout pedicel, strongly ribbed.

Montane zone 4–5000 ft.; rare. Haputale; Kotiyagala; Dickoya. Fl. March, April; pale green, with rows of small purplish or reddish blotches; lip white, with purple spots within, spur yellow (Thwaites).

Endemic. Inadvertently twice described in Fl. B. Ind. v. 784; once as *Tainia maculata*, a name that should be deleted, as also the two last errata on p. 910.

11. ACANTHOPHIPPIUM, *Bl.*

Terrestrial; stem very short, base pseudobulbous; l. few, petioled, plaited; scape short, stout, radical; fl. few, in a short lateral raceme, large, fleshy, pedicels thickened after flg.; sep.

connate in a ventricose fleshy channelled tube, with short free, recurved tips, lateral adnate to the foot of the column; mentum large, saccate; pet. narrow, erect, as long as the sep.; lip very small, stipitate on the foot of the column, side lobes broad, erect, mid lobe recurved, entire, disk lamellate; column short, stout, foot very long, inflexed; anth. 4-celled, pollinia 8, waxy, in two bundles of 4 each, one pair of each bundle smaller, all seated on one granular viscus.—Sp. few; 3 in *Fl. B. Ind.*

A. bicolor, *Lindl. in Bot. Reg.* xx. t. 1730 (1835).
Thw. Enum. 307. C. P. 2365.
Fl. B. Ind. v. 815. Bot. Reg. t. 1730.

Pseudobulbs crowded, with vermiform roots, ovoid, up to 4 in. high and 3 in. diam., of several green fleshy internodes, the uppermost tapering into a short stem formed of the sheathing petioles; l. few, 9–18 in., oval, acuminate, strongly ribbed beneath, base narrowed into the sheathing petiole; ped. 1–3 in., stout, erect, sheathed, 3–7-fld.; sheaths imbricating, oblong, pale purplish, striate; bracts broad, 1 in. long, cymbiform, greenish-purple; pedicels short, stout, with the ov. 1–1½ in.; cal. pitcher-shaped, nearly 1 in. diam., gibbously inflated, base intruded, mouth oblique, lobes short, ovate-rotundate, recurved; pet. erect, narrowly spathulate, obtuse; lip very small, included, jointed on the long erect foot of the column, nearly quadrate, side lobes rounded, erect, mid lobe oblong, obtuse, recurved, disk with 3 lamellæ.

Shady woods in moist low country to 2000 ft.; rare. Hantane; Gampola, abundant. Fl. March, April; bright yellow, the ends of the sepals and petals deep purplish-red.

Endemic. Discovered by J. G. Watson, Superintendent of Peradeniya Gardens, 1832-38.

12. ERIA, *Lindl.*

Epiphytes of various habit, with erect branching stems or with pseudobulbs that are tufted or crowded on a creeping rootstock; l. various, membranous or coriaceous; ped. lateral or subterminal; fl. racemose, rarely solitary, never very large or bright cold; sep. subequal or dorsal narrowest, lateral adnate to the foot of the column, and forming with it a spur-like or saccate mentum; pet. linear or oblong; lip sessile on the foot of the column, entire or 3-lobed; column long or short; anth. imperfectly 4- or 8-celled, pollinia 8, pyriform

or broadly obovoid, waxy, attached in fours or all together by their narrow bases to a granular membrane or viscus.—Sp. upwards of 150; 95 in *Fl. B. Ind.*

Pseudobulbs small.
  Fl. 1–3, pedicelled on the top of the pseudobulb . 1. E. BRACCATA.
  Fl. spicate . . . . 2. E. MUSCICOLA.
Stem elongate.
  Stem very stout, simple.
    Lip entire, or nearly so . . . . . . 3. E. BICOLOR.
    Lip 3-lobed.
      Sep. scurfy . . . . 4. E. TRICOLOR.
      Sep. glabrous . . . . 5. LINDLEYI.
  Stem branched, terete, with woolly scales . . 6. E. THWAITESII.

1. **E. braccata,** *Lindl. in Journ. Linn. Soc.* iii. 46 (1859).
Dendrobium braccatum, Lindl. Gen. and Sp. Orch. 75. Thw. Enum. 299. C. P. 2356.
Fl. B. Ind. v. 787.

Pseudobulbs $\frac{1}{4}$–$\frac{1}{3}$ in. diam., densely crowded on a short branched rootstock with long filiform roots, depressed globose, at first clothed with a network of fibres, at length naked, pale green; l. 2, unequal, caducous, 1$\frac{1}{4}$–1$\frac{3}{4}$ in. long, oblong or oblong-lanceolate, obtuse, apiculate, pale bright green, base shortly sheathing; fl. solitary or 2–3, pedicelled on the top of the pseudobulb, pedicels about 1 in. long, slender, naked; bract $\frac{1}{3}$–$\frac{1}{2}$ as long as and incumbent on the dorsal sepal, triangular-ovate or oblong, acute, cymbiform, green; sep. and pet. 5-veined, $\frac{1}{4}$–$\frac{1}{3}$ in. long, dorsal sep. linear-oblong, obtuse, lateral broader, oblong-lanceolate, subacute; mentum broad, incurved, truncate; pet. like the dorsal sep.; lip rather shorter than the sep., inflexed and recurved, subpanduræformly oblong, tip rounded, disk with 3 ridges; pollinia shortly pyriform; stigma large; fr. $\frac{1}{2}$ in., obovate-ovoid.

Montane zone to 6000 ft.; rather common. Hantane; Ramboda; N. Eliya; Dumbanagala, Rangala; Horton Plains. Fl. October, April–August; creamy white, the lip yellow at the base, and with the ridges pink.

Endemic. Very near *C. reticosa*, Wight (Ic. t. 1637) of the Nilgiri Mts., which has the lip 3-lobed.

2. **E. muscicola,** *Lindl. in Journ. Linn. Soc.* iii. 47 (1859).
Thw. Enum. 299. C. P. 2355.
Fl. B. Ind. v. 789.

Pseudobulbs clustered on a rather slender creeping rootstock, depressed-globose, $\frac{1}{8}$–$\frac{1}{4}$ in. diam., green; l. 2–3 on the top of the pseudobulb, petioled, 1–4 in. long, broadly ovate-obovate or linear to oblanceolate, tip acute or rounded, apiculate, dark green; ped. from between the leaves, with the 3–6-fld. spike 1–2 in. long, filiform, naked; fl. $\frac{1}{6}$–$\frac{1}{4}$ in.

long, secund, sessile; bracts small, ovate or lanceolate; sep. and pet. 3-veined, dorsal sep. lanceolate or linear-lanceolate, finely acuminate, lateral falcately ovate-lanceolate, acuminate; mentum subglobose; pet. as long as the sep., narrowly lanceolate, acuminate; lip half as long as the sep., ovate or oblong-lanceolate, acute, nearly straight, disk with 3 slender ridges; column short, broad, truncate.

Var. β, **oblonga,** *Trim. Syst. Cat. Ceyl.* 88. Pseudobulbs elongated; fl. larger, sep. $\frac{1}{4}$–$\frac{1}{3}$ in.

Chinks of rocks and tree-trunks in moist region throughout montane zone; common. Also in Nillowe Kanda, S. Prov., and in Ritigala, N. C. Prov. Fl. July–October; greenish-white. Var. β in Pedurutalagala.

Nepal, Khasia, Burma. A small but very pretty little plant.

I have seen no specimen of var. β.

3. **E. bicolor,** *Lindl. Gen. and Sp. Orch.* 65 (1830).
Thw. Enum. 299. C. P. 2982.
Fl. B. Ind. v. 793.

Stems tufted, erect, columnar or fusiform, 4–6 in. long, internodes many, $\frac{1}{2}$–1 in. diam., cylindric, clothed with brown sheaths; l. tufted on the narrowed top of the stem, 3–5 by $\frac{1}{2}$–$\frac{3}{4}$ in., linear-lanceolate, acute or obtuse, thinly coriaceous, many-veined; ped. from the axils of the old sheaths, with the erect many-fld. raceme 4–5 in. long, stout, erect or inclined, puberulous, bearing a few oblong, acuminate, membranous bracts, rhachis brown; bracts $\frac{1}{3}$ in., ovate-lanceolate, acuminate, spreading and deflexed, scarious; pedicel with ov. $\frac{1}{3}$–$\frac{1}{2}$ in.; fl. $\frac{1}{2}$ in. long; sep. 3-veined, dorsal ovate-lanceolate, outer pair of veins branching, lateral falcately ovate, subacute; mentum rounded, saccate; pet. shorter than the sep., linear, acute; lip ovate-lanceolate, acute, laterally obscurely lobed, claw broad, deeply saccate; foot of column short.

Montane zone above 4000 ft.; common. Fl. Sept.–Oct.; pure white, on purple-red stalks, whence the specific name.

Endemic. A very familiar up-country species, and generally known as the 'Lily-of-the-Valley Orchid.'

4. **E. tricolor,** *Thw. Enum.* 429 (1864).
C. P. 3840.
Fl. B. Ind. v. 798.

Stems tufted, erect, fleshy, rooting at the base, 3–5 in. long, fusiform, of many short cylindric internodes, $\frac{1}{2}$–$\frac{2}{3}$ in. diam., young clothed with short obtuse brown sheaths; l. many, in a terminal tuft, 6–8 by $\frac{1}{2}$–$\frac{2}{3}$ in., distichous, recurved, linear-lanceolate, strongly veined when dry, base shortly sheathing; ped. from the nodes of the stem, short, naked, or with a few bracts, with the laxly many-fld. raceme; 3–4 in. long, fl. about $\frac{2}{3}$ in. broad, bracts broadly oval, obtuse,

much shorter than the ov.; pedicel with the furfuraceous ov. $\frac{1}{4}$ in.; sep. scurfy, dorsal broadly ovate-oblong, obtuse, lateral falcately ovate, subacute; mentum rounded; pet. narrower, ovate-oblong, obtuse, glabrous; lip shortly clawed, 3-lobed, side lobes erect, subfalcate, obtuse, mid lobe orbicular, reflexed, tip recurved, disk with a central ridge;. column rather long, truncate.

'More elevated parts of the Central Province' (Thwaites).

Fl. (?); creamy-white, the lip with the side lobes pink, and the mid lobe yellow.

Endemic.

5. **E. Lindleyi,** *Thw. Enum.* 299 (1861).

Dendrobium bicolor, Lindl. Gen. and Sp. 90. *E. bicolor*, Lindl. in Journ. Linn. Soc. iii. 58. *E. ephemera*, Rchb. f. in Walp. Rep. vi. 272. C. P. 2761.

Fl. B. Ind. v. 799.

Stems 6–18 in., densely tufted, rooting at the base, as thick as a goose-quill in the middle, clavate at the top, and tuberous at the very base, smooth, internodes many, terete, clothed with short acute sheaths; l. clustered on the terminal internodes, sessile, 3–4 in. long, oblong or oval-lanceolate, obtuse, many-veined when dry; ped. from the upper nodes, 1–1$\frac{1}{2}$ in., 2–3-fld., glabrous; bracts large, $\frac{1}{2}$–$\frac{3}{4}$ in., broadly oblong, obtuse, green, recurved; pedicel with ov. $\frac{1}{3}$ in.; sep. $\frac{1}{2}$-$\frac{2}{3}$ in. long, glabrous, dorsal ovate-oblong, obtuse, lateral falcately ovate-oblong; mentum rounded; pet. linear-oblong, falcate, obtuse, 3–5-veined; lip very shortly clawed, side lobes broad, acute, almost as long as the suborbicular truncate mid lobe, disk with 2 calli between the side lobes; column long, top narrowed, truncate; anth. very small ('pollinia 8, wedge-shaped, all united by a viscus.' *Ic. in Herb. Perad.*); fr. 1 in., narrowly clavate.

Montane zone to 7000 ft.; rather common. Hantane. Fl. Sept.–Dec.; white, the large bracts often yellow.

Endemic.

6. **E. Thwaitesii,** *Trim Syst. Cat. Ceyl.* 88 (1885).

E. velutina, Thw. Enum. 299 (non Lodd.). C. P. 2349.

Fl. B. Ind. v. 803.

Stem 6–12 in., rooting at the nodes, as thick as a swan's quill, branching, internodes very short, clothed with silky sheaths, roots pubescent, branches short, leafy at the top, softly pubescent; l. 2–5 by $\frac{1}{2}$–1 in., linear- or oblong-lanceolate or oblanceolate, obtuse or subacute, thickly coriaceous, sometimes subfalcate, silkily tomentose, or woolly on both surfaces; ped. stout, terminal, with the lax-fld. spike 3–4 in.

long, suberect, woolly; bracts $\frac{1}{3}$–1 in., oblong, obtuse woolly; fl. subsessile; sep. $\frac{1}{4}$ in. long, coriaceous, woolly or tomentose, dorsal oblong, obtuse, lateral broadly ovate-oblong, obtuse, decurved; mentum rounded, strongly incurved; pet. linear, subacute, glabrous; lip shorter than the sep., tongue-shaped, recurved, fleshy, tomentose, side lobes very small, mid lobe small, ovate, obtuse; column very short, broad; anth. pubescent on the crown; fr. $\frac{1}{2}$ in. long, ellipsoid, shortly pedicelled.

Moist region, 2–6000 ft.; rare. Dolosbagie (Thwaites); near Hakgala (Nock); Ballangoda (Lewis). Fl. October–January; pale dull yellow. Endemic.

E. profusa, Lindl., is another of Nightingale's orchids said to have been obtained in Ceylon (Bot. Reg. 1842, Misc. 2). It flowered at Sion in 1841. Nothing more is known of it.

13. **ALVISIA,*** *Lindl.*

Pseudobulbs small, sessile on a slender rootstock, 1–2-leaved; l. sessile, small; ped. terminal on the pseudobulb, erect, filiform, flexuous; fl. distant in an elongate spike, minute; sep. shortly connate at the base, dorsal linear-oblong, obtuse, apiculate, recurved, mid vein broad, lateral connivent, falcately ovate, strongly upcurved beyond the middle, very obtuse, bases confluent together and with the long foot of the column in a broad deep sac (mentum); pet. half as long as the sep.; lip very small, inserted on the foot of the column, claw broad, sigmoid, dilated into an obcordate, fleshy limb; column very minute, depressed, with the two projecting incurved arms in front; anth. minute, 2-lobed, 2-celled, pollinia 8, obovoid, waxy, free.—Monotypic.

A. tenuis, *Lindl. Fol. Orchid.* Alvis. (1859).
Thw. Enum. 300. Eria articulata, *Lindl. in Journ. Linn. Soc.* iii. 47. C. P. 2655.
Fl. B. Ind. v. 788.

Pseudobulbs $\frac{1}{4}$–$\frac{1}{3}$ in., ellipsoid or subglobose; l. sessile, $\frac{1}{2}$–1 in., broadly oblong or oblanceolate, apiculate, 5-veined, membranous, dark green; ped. with the long erect flexuous few or many-fld. spike 1–3 in., rhachis often zigzag, with the fl. at the angles; bracts $\frac{1}{12}$ in., cymbiform, membranous, sheathing the small obconic ov.; sep. $\frac{1}{10}$–$\frac{1}{8}$ in., rather fleshy, tips rounded, dorsal thickened in the middle, lateral almost sigmoid, veinless; mentum half as long as the sep. upcurved,

* Dedicated to Haramanis de Alivis Seneviratna, the Sinhalese artist attached to the Ceylon Botanic Gardens from 1823 to 1861.

tip rounded; pet. linear-oblong, faintly 1-veined; lip. immersed in the mentum, inserted on the top of the very long foot of the column, within the margins of the connate lat. sep.; anth. didymous (?), pollinia microscopic.

Damp low country below 2000 ft.; rather rare. Ambagamuwa (Thwaites); Kotmalie (Braine); Karawita Kande, near Ratnapura. Fl. Feb., March; bright orange-salmon-coloured.

Endemic.

This curious plant, which was included in *Eria* by Bentham in Gen. Plant., and by myself in Fl. B. Ind., differs remarkably from that genus in habit, in the connate bases of the sep., and in the very minute column, with two projecting incurved arms in front. The flowers are very difficult of analysis in dried specimens, and the drawing in the Peradeniya collection is not altogether satisfactory. The anth. is there represented as didymous.

14. **TAINIA,** *Bl.*

Terrestrial herbs, with a creeping rootstock, bearing a 1-leaved tuberous pseudobulb; l. solitary, long-petioled, coriaceous; ped. from the base of the pseudobulb, tall, slender, with few sheaths; fl. racemed; sep. narrow, spreading, lateral falcate, adnate to the saccate base of the lip, and forming a mentum with it; pet. linear, falcate, spreading; lip adnate to the foot of the column, 3-lobed, disk lamellate; column slender, incurved, base produced into a short foot; anth. 2-celled, crowned with 2 short horns or tubercles, pollinia 8, waxy, united in fours by a granular viscus, subequal, globosely pyriform.—Sp. about 20; 14 in *Fl. B. Ind.*

T. bicornis, *Trim. Syst. Cat. Ceyl.* 88 (1885).

Ania bicornis, Lindl. in Bot. Reg. 1842, 37. *Eria bicornis.* Rchb. f. in Walp. Ann. vi. 269. C. P. 3190.

Fl. B. Ind. v. 820. Wight, Ic. t. 914 (*Ania latifolia*). Bot. Reg. 1844, t. 8.

Pseudobulb fusiform or narrowly pyriform, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, with stout vermiform roots; l. 4–6 by 2–$2\frac{1}{4}$ in., oblong or ovate-oblong, acute or acuminate, many-veined, leathery, base acute; petiole 3–5 in., slender, erect, naked; ped. with raceme 8–16 in., with a few distant spreading membranous bracts; raceme erect, laxly many-fld.; fl. 1–$1\frac{1}{4}$ in. across, pedicel very short, with the ov. $\frac{1}{4}$ in.; bracts small, lanceolate, spreading; dorsal sep. linear-oblong, obtuse, erect, lateral narrowly linear-spathulate, obtuse, falcately decurved; mentum rounded; pet. like the lateral sep.; lip. much shorter than the sep., side lobes erect, rounded, mid lobe short, broad, subquadrate, emarginate, disk with three crests; anth. shortly 2-horned.

Moist region at about 3000 ft.; rare. Hantane; Punduloya (E. Green). Fl. Jan.–March; sep. and pet. pale olive-green, stained with purple, lip bright yellow, with purple dots at sides of disk.

Also in S. India.

T. maculata, Hk. f. (*Ania maculata*, Thw.) has to be deleted; the plant is properly referred to *Chrysoglossum*, q. v. (See Fl. B. Ind. vi. 193.)

15. ARUNDINA, *Bl.*

Terrestrial, erect herbs; rootstock creeping, sheathed; stem elongate, rigid, terete, leafy; l. distichous, narrow, flat, jointed on their sheathing bases; fl. in terminal, erect, stiff, simple, few-fld. racemes; bracts distichous in bud, coriaceous, persistent; sep. and pet. oblong or lanceolate, flat, spreading, many-veined; lip large, broad, sessile on the base of the column, and embracing it by its convolute side lobes, mid lobe flat, crisped, disk lamellate; column long, slender, narrowly winged, foot 0; anth. 4-celled, pollinia 8, in two superposed unequal groups of 4, united by a viscus, waxy, lower pair of each group smaller, incumbent on the upper.—Sp. 8; 7 in *Fl. B. Ind.*

A. minor, *Lindl. Gen. and Sp. Orch.* 125 (1831).
Thw. Enum. 301. C. P. 485.
Fl. B. Ind. v. 857.

Stems 1–2 ft., tufted on the hard rootstock, as thick as a small goose-quill, terete, leafless below, and there clothed with long appressed distichous membranous sheaths, leafy above; l. many, erect, 2–3 by $\frac{1}{4}$ in., linear, acute, strict, keeled, striate, sheath membranous, appressed, smooth, ribbed; raceme 2–3 in., 3–4-fld., ped. and rhachis stout, stiff; bracts broadly ovate, persistent; pedicel with ov. $\frac{3}{4}$ in.; fl. $1\frac{1}{2}$ in. across; sep. and pet. subacute; fr. $1–1\frac{1}{4}$ in., fusiform, erect.

Wet places in moist region, up to 4000 ft.; rather common. Dolosbagie; Ramboda; Galagama; Atampitiya, Uva. Fl. Jan., Feb.; pale pink, lip yellow, with rose-coloured margins.

Endemic.

16. AGROSTOPHYLLUM, *Blume.*

Epiphytes; stems tufted, flattened, stiff, rooting at the very base only, pseudobulbs 0; l. distichous, vertical, linear, or linear-oblong, sheath flattened, persistent; fl. very small, crowded in a sessile terminal head, mixed with paleaceous bracts; sep. erect, conniving, concave, lateral broader, adnate to the foot of the column; pet. narrow; lip adnate to the foot of the column, erect, entire, or 3-fid.; column short,

stout, thickened above; anth. 2-celled, pollinia 8, ovoid, waxy, seated in fours on a small viscus.—Sp. 7; 6 in *Fl. B. Ind.*

A. zeylanicum, *Hook. f. Fl. B. Ind.* v. 825 (1890).

Appendicula longifolia, Bl. ex. Thw. Enum. 306. Trim. Cat. Ceyl 90. C. P. 3208.

Fl. B. Ind. v. 825.

Stem 8–12 in. long, strongly compressed, with the sheaths ½ in. broad, sheathed throughout with long, distichous, equitant, laterally compressed, white, coriaceous, truncate sheaths; roots tortuous; l. 3–5 by ⅓–½ in., exactly linear, obtuse or retuse, apiculate, thinly coriaceous, smooth, striate, midrib slender; heads of fl. sessile, 1 in. diam., bracts slender, scarious, shorter than the fl.; ov. after flg. fusiform, ⅓ in. long, perianth (in drawing) ⅛ in. long, erect, white.

Low country, in the moist region; very rare. Road to Adam's Peak, abundant (McKenzie). Ambagamuwa Dist. (Thwaites). Fl. Feb.; white. Endemic (?).

In the absence of flowering specimens it is impossible to determine whether or no this plant may not be referable to an Indian species. It closely resembles in habit and foliage *A. callosum*, Rchb. f. of India, figured in Ann. Bot. Gard. Calcutt. viii. t. 213, which has much larger fl. According to a drawing in Herb. Peraden. the fl. of *A. zeylanicum* are very minute.

17. IPSEA, *Lindl.*

Pseudobulbous, terrestrial, erect herbs; l. 1–2, long, narrow, plicate; scape tall, erect, slender, sheathed, few-fld.; fl. large, bracts spathaceous; sep. subequal, spreading, lateral ovate-oblong, adnate to the base of the column; pet. narrower than the sep.; lip sessile on the base of the column, erect, side lobes oblong, erect, mid lobe small, obovate, disk crested, base saccate; column slender, clavate above, foot 0; anth. 4-celled, pollinia 8, pyriform, waxy, in 2 groups of 4 each, united by a viscus, one pair of each group much smaller.—Sp. 3 or 4; 3 in *Fl. B. Ind.*

I. speciosa, *Lindl. Gen. and Sp. Orch.* 124 (1831).

Thw. Enum. 301. *Pachystoma speciosa*, Rchb. f. Trim. Syst. Cat. Ceyl. 88. C. P. 2364.

Fl. B. Ind. v. 812. Wight, Ic. t. 1663. Bot. Mag. t. 5701.

Whole plant puberulous; pseudobulbs ½–1 in. diam., clustered, depressed-globose or broadly ovoid, hard, brown; l. 6–10 by ⅙–½ in., narrowly linear, acuminate, narrowed into a slender petiole, 3-veined; ped. 6–18 in. long, slender, with a few pale oblong-lanceolate acute loose white sheaths open to the base; bracts as long as the ov., and, like the sheaths herbaceous; fl. 2–3 in. diam., pedicels decurved, with the ov.

$\frac{1}{4}$–$\frac{3}{4}$ in., sep. spreading, puberulous, lateral oblong or ovate-oblong, subacute; pet. narrowly spathulate, obtuse, shorter than the sep.; lip rather shorter than the sep., lateral lobes large, suborbicular, erect, mid lobe smaller, orbicular-obovate, disk with 3–5 crenulate ridges, terminating on the mid lobe; apex of column subcapitate; anth. small, depressed.

Open patanas in grass, in montane zone, 3–6000 ft.; rather common. Hantane; Teldeniya; Maturata; Galagama; N. Eliya; Hakgala, &c. Fl. Sept.–Feb.; bright golden yellow, the ridges on the lip narrowly tipped with crimson.

Endemic. A beautiful plant, the Daffodil Orchid of the English.

Pachystoma senile, Rchb. f. (*Apaturia montana*, Lindl. Gen. and Sp. Orch. 131) is given for Nuwara Eliya (Macrae) by Lindley. It is a common Indian plant from the Himalaya to Malabar, and figured (*A. Lindleyana*) in Wight, Ic. t. 1662. Thwaites mistook *Aphyllorchis montana* for this. I have seen no Ceylon specimens, nor are there any in Lindley's Herbarium, but it may occur in the island.

18. **PHAJUS,** *Lour.*

Tall, stout, terrestrial herbs; stem leafy, base more or less pseudobulbous; l. broad, plaited; fl. in peduncled racemes from the side of the pseudobulb, or axillary, large; sep. and pet. subequal, spreading or suberect; lip erect, 3-lobed, adnate to the base of the column, and embracing the latter by its convolute side lobes, base gibbous or spurred; column long, stout, foot 0, or very short; anth. incompletely 4-celled, pollinia 8, waxy, in superposed pairs, the two lower pairs of each 4 smallest, all seated by fours on a granular membrane.—Sp. about 14; 7 in *Fl. B. Ind.*

Ped. from the pseudobulb . . . . 1. P. Wallichii.
Ped. axillary . . . . 2. P. luridus.

1. **P. Wallichii,** *Lindl. in Wall. Pl. As. Rar.* ii. 46, t. 158 (1831).

P. bicolor, Thw. Enum. 300 (non Lindl.). C. P. 2368.

Fl. B. Ind. v. 816. Lindl. Sert. Orchid. t. 23. Bot. Mag. t. 7023 and 4078 (*P. bicolor*). Wight, Ic. t. 1659-60 (*P. bicolor*). Ann. Bot. Gard. Calcutt. viii. t. 150.

Pseudobulbs crowded, ovoid, $1\frac{1}{2}$ in. diam., of many internodes, annulate, green, emitting vermiform roots; l. few, 2–3 ft., oblong, oval, or lanceolate, acuminate, strongly ribbed beneath, base sheathing or petioled; ped. from the base of the pseudobulb, 3–4 ft. high, as thick as a swan's quill, green, bearing a few distant acute sheaths an in. long; raceme loosely many-fld., bracts like the stem-sheaths, herbaceous, caducous; fl. 4 in. broad; sep. oblong-lanceolate, acuminate, widely spreading; pet. linear-oblong, obtuse; lip with the

margins of the convolute side lobes recurved, crisply crenate, as is the orbicular mid lobe, spur ½ in. long, horn-like, strongly incurved or involute, acuminate; fr. 2 in. long, clavately fusiform.

Open pastures in montane zone 3–7000 ft.; rather common, especially at the higher elevations. Fl. Sept.–Nov., April, June; rather variable in colour; sep. and petals pale purplish-orange above, and greenish-yellow on back, but sometimes whole fl. pale orange-yellow, the lip a pale uniform orange-yellow; or lip white, more or less suffused with pink, or all red-violet. The colours in Lindley's fine plate are too vivid.

Endemic. It is remarkable that so conspicuous a plant should have no recorded native name.

2. **P. luridus,** *Thw. Enum.* 300 (1861).
C. P. 613.
Fl. B. Ind. v. 816.

Stem 2 ft. high, with vermiform roots at the base, stout, leafy, clothed more or less wholly with large, lanceolate, acuminate, green sheaths; l. 12–18 by 3–5 in., lanceolate, acuminate, or oblong-lanceolate, strongly ribbed beneath, petiole sheathing; ped. 1–2, from the lower leaf axils or sheaths, 8–10 in. long, erect, as thick as a swan's quill, raceme 10–12 in., few-fld; bracts oblong, acute, pubescent, caducous; fl. 2 in. broad, sep. and pet. spreading; sep. oblong-lanceolate, acuminate; pet. rather narrower, broader upwards, acute; lip cucullate, rounded, obscurely 3-lobed, margins undulate, above sparsely hairy, with 2 contiguous rugulose ridges, glabrous beneath and grooved in the middle, base forming with the very short foot of the column a short spur or mentum; column short, stout, top toothed; anth. hairy; fr. 2 in., fusiform.

Moist region in the low country; rare. Pasdun Korale; Reigam Korale; Rakwane; Hewesse. Fl. August, Sept.; sep. and petals yellow, striped longitudinally with red, lip yellow.

Endemic. The reference to Trim. Syst. Cat. Ceyl. in Fl. B. Ind. v. 818 is an error.

19. CALANTHE, *Br.*

Terrestrial herbs; stem leafy, base often pseudobulbous; l. plaited; scape from the side of the pseudobulb; sep. subequal, spreading; pet. oblong or spathulate; lip adnate to the top of the column, opposite the stigmatic cavity, 3-lobed, mid lobe bifid or bipartite, disk tubercled, spur long, slender; column obliquely truncate; anth. small, 2-celled, pollinia 8, in two bundles, narrowly pyriform, waxy, pairs superposed in each bundle, one pair usually smallest.—Sp. about 80; 34 in *Fl. B. Ind.*

The above generic characters (drawn up in accordance with Dr. Trimen's rules for this Flora) would exclude many species of the genus.

Mid lobe of lip obcordate . . . . . . 1. C. PURPUREA.
Mid lobe of lip bipartite . . . . . . 2. C. VERATRIFOLIA.

1. **C. purpurea,** *Lindl. Gen. and Sp. Orch.* 249 (1833).
Lindl. in Bot. Reg. 1844, sub t. 37. Lindl. Fol. Orch. Cal. 6. *C. Masuca*, Thw. Enum. 308 (non Lindl.). Trim. Syst. Cat. Ceyl. 88. C. P. 2366.
Fl. B. Ind. v. 851.

Rootstock stout, with vermiform roots, bearing a row of close-set annulate pseudobulbs $\frac{1}{2}$–$\frac{3}{4}$ in. long; stem erect; l. many, 12–18 in., ovate-lanceolate, acuminate, tapering into the broadly sheathing ribbed petiole, pubescent on both surfaces, 7-costate beneath; ped. 8–10 in., stout, and raceme 6–8 in., tomentose, few or many-fld., sheaths lanceolate, herbaceous; bracts $\frac{1}{2}$–$\frac{3}{4}$ in., ovate-lanceolate, longer or shorter than the long pedicels, persistent; fl. 1–1$\frac{1}{2}$ in. broad; pedicel with ov. 1–1$\frac{1}{2}$ in.; sep. ovate-oblong, apiculate, 5-veined, pubescent; pet. shorter, broader; lip shorter or rather longer than the sep., side lobes oblong, obtuse, falcate, mid lobe cuneately obcordate, or 2-cleft, disk prominently warted at the base, spur slender, 1 in. or more, obtuse, pubescent; pollinia narrow, stipitate; fr. 1$\frac{1}{2}$ in., fusiform, pendulous from the thickened pedicel.

Moist region up to 3000 ft.; rather common. Fl. Feb., July, August; bright or dull, pale purplish-pink, with the lip darker.

Very near *C. Masuca*, Lindl., of India and Java, well figured in Bot. Reg. 1844, t. 37 and Bot. Mag. t. 4541, which differs in its leaves glabrous above, and in the larger flowers with a different lip. This was also recorded from Ceylon by Lindley (Macrae), and may possibly occur, being widely distributed in India.

2. **C. veratrifolia,** *Br. in Bot. Reg.* ix. t. 720 (1823).
Lindl. Gen. and Sp. Orch. 249; Fol. Orch. Cal. 8. Thw. Enum. 308. C. P. 2367.
Fl. B. Ind. v. 851. Wight, Ic. t. 1664 (*C. Perrottetii*). Bot. Reg. t. 720 (whole plant reduced). Bot. Mag. t. 2615.

Rootstock stout, horizontal, with vermiform roots; stems crowded, stout, about 3–5-leaved; l. 15 by 2–3 in., ovate or oblong-lanceolate, acuminate, glabrous, or sparsely puberulous beneath, narrowed into a sheathing petiole, sometimes 5 in. long, veins strong beneath; ped. several, 2–2$\frac{1}{2}$ ft., very stout, pubescent, sheaths scattered, pubescent, green; raceme 3–4 in., many-fld., rhachis stout, and pedicels and ovary pubescent; bracts $\frac{1}{2}$–1 in., lanceolate or ovate-lanceolate, acuminate, green, pubescent, shorter than the long slender almost horizontal white pedicels, which are 1–1$\frac{1}{4}$ in. long; fl. 1$\frac{1}{2}$ in. broad, dorsal sep. oblong, lateral obovate-oblong, apiculate,

5-veined; pet. obovate-oblong, or oblanceolate, 3–5-veined; lip as long as the sep., side lobes oblong, obtuse, mid lobe cleft into 2 linear obtuse falcate diverging lobes, disk with a few small warts at the base; fr. ellipsoid, $1\frac{1}{4}$ in., pedicel stout, decurved.

Var. β, **discolor,** *Lindl. Fol. Orch. Cal.* 8. *Thw. Enum.* 308. C. P. 2371.

Smaller, lip yellow-brown stained with purple.—*Trimen.*

Moist region; rather rare or local. Maturata (Nock). Var. β, Nuwara Eliya. Fl. Feb.–April, July; pure white, the lip often pale pink; in var. β the lip dull yellow, with a purplish central stain.

Also in S. India, Malay Is., Australia.

20. EULOPHIA, *Br.*

Terrestrial herbs, pseudobulbous or with a tuberous rootstock; l. plaited; scape lateral or terminal on the pseudobulb or rootstock, erect; fl. racemose; sep. and pet. free, spreading or erecto-patent; lip erect from the base or foot of the column, base saccate, or with a mentum or short spur, side lobes embracing the column, mid lobe spreading or recurved, disk crested or echinate; column long, base produced into a foot or nob, top oblique, entire; anth. 2-celled, pollinia 2, globose, waxy, attached by a short broad strap to a flat disciform gland.—Sp. probably 70; 26 in *Fl. B. Ind.*

Column not produced into a foot.
  Pseudobulb epigeal.
    Sep. linear-oblong, acute or obtuse . . 1. E. VIRENS.
    Sep. lanceolate, acuminate . . . . . 2. E. GRAMINEA.
  Rootstock tuberous, hypogeal . . . . 3. E. MACROSTACHYA.
Column produced into a foot.
  L. and fl. produced together . . . . 4. E. NUDA.
  L. produced after fl. . . . . . . 5. E. SANGUINEA.

1. **E. virens,** *Br. in Lindl. Gen. and Sp. Orch.* 182 (1833). *Limodorum virens*, Sw.; Moon, Cat. 60. Thw. Enum. 302. C. P. 2369. Fl. B. Ind. vi. 1. Bot. Mag. t. 5579 (from Ceylon specimen). Wight, Ic. t. 913.

Pseudobulb $1–1\frac{1}{2}$ in. diam., conico-ovoid, clothed with broad acute membranous sheaths; roots short, vermiform; l. many from the pseudobulbs, 6–24 by $\frac{1}{5}–1$ in., grass-like, finely acuminate, keeled, 3–5-veined, base sheathing; ped. with erect branching panicle 1–3 ft., green or more or less stained with brown, sheaths few, distant, branches forming elongate lax-fld. racemes; bracts minute, ovate, acute, persistent; ped. with ovary $\frac{1}{2}–1$ in.; sep. $\frac{3}{4}$ in., linear-oblong, obtuse, subacute, or apiculate; pet. broader, oblong, apiculate; lip obovate-

oblong, side lobes small, erect, mid lobe about as long, broadly oblong, tip rounded, disk with 5 ridges crested with subulate processes, spur short, cylindric, incurved; anth. umbonate, pollinia 2, globose, strap short, gland large; capsule ellipsoid-oblong, 1½ in., pendulous, ribs rather slender.

Dry and intermediate regions in open rocky places; rather rare. Kurunegala Rock; Puttalam; Chunavil, Jaffna Dist.; Bintenne; Trincomalie. Fl. Feb. June, August, Oct.; sep. and pet. yellowish-green, lip white with crimson lines.

Also in Peninsular India. A handsome ground-orchid.

The colouring of the Bot. Mag. plate is not that of the Ceylon plant.—*Trimen.*

2. **E. graminea,** *Lindl. in Wall. Cat.* n. 7372 (1828).
Eulophia Sp., Trim. Syst. Cat. Ceyl. 89. C. P. 3958.
Fl. B. Ind. vi. 2, 8, 196. Ann. Bot. Gard. Calcutt. viii. t. 238.

Pseudobulbs conic, clothed with broad, acute, membranous sheaths; roots vermiform; l. 6–10 by ¼–3 in., narrowly linear, finely acuminate, grass-like, base sheathing; ped. with the erect branching panicle 1–2 ft., slender, branches suberect, forming lax-fld. racemes; bracts small, spreading, lanceolate, persistent, pedicel with ov. slender, ½–1 in.; sep. ½ in., linear-lanceolate, acuminate; pet. rather broader, lanceolate, acuminate; lip obovate-oblong, side lobes small, erect, mid lobe about as long, obovate, tip rounded, disk with 5 ridges crested with hooked processes, spur short, cylindric, incurved; anth. hemispheric, pollinia 2, globose, strap short, broad, gland large; fr. 1–1¼ in., clavate, ribs slender.

Dry region, by roadsides and other open places; rare. Near Dambulla; Maravila, near Chilaw (Nevill). Fl. March, April; sep. and pet. greenish, veined and tessellate, with lake; lip white, similarly veined.

Also in S. India, E. Bengal, Nicobar Is., Malay Peninsula. There is a specimen from Kœnig in Herb. Mus. Brit. labelled '*Satyrium zeylanicum.*'

3. **E. macrostachya,** *Lindl. Gen. Sp. Orch.* 183 (1833).
Thw. Enum. 301. C. P. 3188.
Fl. B. Ind. vi. 4. Bot. Reg. t. 1972; Bot. Mag. t. 6246 (both from Ceylon specimens). Wight, Ic. tt. 1667–8.

Pseudobulbs 2–6 in., up to ¾ in. diam., fascicled, terete or very narrowly fusiform, young sheathed with membranous scales, internodes few; roots thick, vermiform; l. 2–4, petioled, 6–10 by 2–2½ in., oblong-lanceolate, acuminate, 3–7-veined, base narrowed into a channelled petiole 4–8 in. long; ped. from the base or side of the pseudobulb, with the lax-many-fld. raceme 2–3 ft., stout, red-brown, sheaths tubular, 1 in. long, appressed; bracts ¼ in., linear-lanceolate, persistent, a few lowest longer and empty; pedicel with ovary ¾ in.; sep. ½–⅝ in. long, lanceolate, acuminate, dorsal arching,

lateral spreading; pet. rather shorter, acuminate, erect; lip very broad, saccate, with rounded erect side lobes, mid lobe short, recurved, rounded-obcordate, deeply cleft, spur a very short, globose, or ampulliform, purple sac, disk with 2 short lamellæ; column stout, base produced into a very short foot; anth. umbonate, pollinia trapeziform, united by a short broad strap to a rather large orbicular purple gland.

Moist region up to 4000 ft.; Heneratgoda. Fl.; sep. and pet. pale or purplish-green, lip yellow, with orange or purple veins on the side lobes.
Also in S. India.

4. **E. nuda,** *Lindl. in Wall. Cat.* n. 7371 (1828).
Cyrtopera fusca, Wight, Thw. Enum. 429 (*Cyrt. fuscum*). *C. Gardneri,* Thw. Enum. 302. *Cyrtopodium fuscum,* Trim. Cat. Ceyl. 89. C. P. 2370.
Fl. B. Ind. vi. 5. Wight, Ic. t. 1690.

Rootstock large, tuberous, annulate, slightly branched, with long vermiform roots; stem 1–3 ft., rather slender, erect, leafy, with a few basal sheaths; l. 2 at flg. (1–2 more afterwards), 1–2 ft. by 1–1½ in., linear to narrowly lanceolate, acuminate, strongly plaited, narrowed into the long sheath; ped. from near the base of the leafing stem, 1½–2 ft., erect, stiff, sheaths few, distant; raceme 8–9 in., erect, laxly 10–20-fld.; bracts subulate-lanceolate, much shorter than the ov., membranous, pedicel with ov. ½–¾ in.; sep. 1 in. long, connivent at the base, oblong, acute, lateral inserted on the foot of the column; mentum broadly conical, tip rounded; pet. connivent, oval-oblong, obtuse; lip large, ovate-oblong, obtuse, recurved, side lobes obscure, margins crisped, base saccate, disk with many crested ridges; column rather long, acute, base produced in a foot; anth. umbonate, pollinia ovoid, divaricate on the top of the short broad strap, gland large; fr. 1½–2 in., fusiform, pendulous.

Moist region in the low country to 3000 ft.; rather rare. Mirigama (Wright); Dolosbagie. Fl. Feb–June; sep. greenish-purple, pet. white, lip white or yellow, stained with pink or purple, spur dark purplish-green.
S. India, E. Bengal, Burma.
Four varieties from the Himalayan region are figured in Ann. Bot. Gard. Calcutt. v. tt. 47–50, but none are much like the Ceylon form.—*Trimen.*

5. **E. sanguinea,** Hk. f. in Fl. B. Ind. vi. 8 (1890).
Cyrtopera rufa, Thw. Enum. 302. *Cyrtopodium rufum,* Trim. Syst. Cat. Ceyl. 89. C. P. 3566.
Fl. B. Ind. vi. 196. Bot. Mag. t. 6161 (*Cyrtopera sanguinea*). Ann. Bot. Gard. Calcutt. t. 242.

Rootstock horizontal, tuberous, annulate; roots very stout, vermiform; l. appearing after the fl. (not seen); flg. stem 2 ft., very stout, erect, green or red, with a few broad, brown, semi-amplexicaul sheaths 1 in. long; raceme 6–5 in., lax-fld

erect; bracts subulate-lanceolate, flexuous, as long as the ov., persistent, pedicel with ovary ½–1 in.; sep. 1 in. long, dorsal erect, ovate-lanceolate, acuminate, lateral inserted on the foot of the column, spreading, obliquely ovate, acuminate; mentum short, conical, incurved, obtuse; pet. ⅓ shorter than the sep., spreading, obovate, tip acute or minutely notched and apiculate; lip shorter than the sep., saccate, side lobes small, obtuse, mid lobe small, rounded or broadly ovate, recurved, apiculate, disk with many hairy ridges; column produced into a foot; anth. umbonate, pollinia subglobosely ovoid, erect on a short strap with a large gland; fr. 2½ in., ellipsoid, pendulous.

Moist region to 4000 ft.; rare. Hantane; Moneragala, Uva (Wall); Haputale (Wright); Mirigama (Wright). Fl. Jan.–April; sep. and pet. dull purplish-red, as is the whole infl.; lip paler, pinkish-green, with dark purple wings and a green spur.

E. Himalayas and Khasia.

The plant is quite leafless at the time of flowering.

A specimen that flowered at Kew, and is figured in the Botanical Magazine, had the sep. and pet. reddish-brown, inclining to purple, the lip nearly white, suffused with pink towards the margin and on the side lobes, and with two purple spots on the disk.—J. D. H.

The following species of *Eulophia* have been erroneously regarded as Sinhalese:—

E. explanata, Lindl., a Nepal species; Lindl. erroneously quotes Ceylon (Macrae) for it in Gen. and Sp. Orch. 180 (see Hook. Ic. Pl. t. 1882) *E. bracteosa*, Lindl. (*E. grandiflora*, Lindl.), is also given by Lindley (l. c. 181) for Ceylon (Macrae), but erroneously. It is from the Khasia and Burma hills. *E. herbacea*, Lindl., is also given for Ceylon (Macrae) by Lindley (l. c. 182), but probably also in error.

21. GEODORUM, *Jacks.*

Herbs, with a tuberous leaf-bearing rootstock; l. few, plaited, base sheathing; ped. from the base of the tuber; fl. in a lax-fld. decurved raceme, resupinate, bracts narrow, membranous; sep. and pet. similar, conniving, oblong or obovate-oblong, acute; lip superior, sessile on the base or short foot of the column, as long as the sep., cymbiform, membranous, margins incurved; base saccate or shortly spurred, disk appendaged; column short; anth. 2-celled, 2-auricled, from detached portions of the top of the column which adhere to it, pollinia 2, globose, waxy, subsessile on a broad gland.—Sp. 6–8 (?); 4 in *Fl. B. Ind.*

G. dilatatum, *Br. in Ait. Hort. Kew.* ed. 2, v. 207 (1813).

Moon, Cat. 60. Thw. Enum. 308. C. P. 3196.

Fl. B. Ind. vi. 17. Roxb. Cor. Pl. i. t. 39 (*Limodorum recurvum*). Wight, Ic. t. 912 (fl. too large).

Rootstock a chain of hypogeal tubers about ½ in. diam., with thick vermiform roots; leafing stem 4–5 in., sheathed; l. 2–3, sessile, 8–12 in., oblong-lanceolate, acuminate, base narrowed, sheathing, bright green, shining, 3–5-ribbed beneath; ped. from the base of a tuber, often distant from the l., 16–20 in. high, stout, with a few herbaceous tubular sheaths; raceme 3–5 in., sharply decurved in flower, erect in fr, rather closely 10–12-fld.; bracts lanceolate, membranous, shorter than the ov.; fl. subsessile, sep. and pet. ½ in. long, linear-oblong, acute or obtuse; lip superior, subpanduriform, tip retuse, disk concave, with a broad ridge ending in a yellow warted callus; fr. 1¼–1½ in., fusiform, pendulous from a short decurved pedicel.

Moist region, Central province. Fl. June; white, the lip suffused with yellow and pink.

Also in Peninsular India and Burma.

A specimen that flowered in the Peradeniya Gardens agrees better with Roxburgh's fig. 2, *G. purpureum* (*Limodorum*), t. 40, than with his t. 39 *L. recurvum* (= *G. dilatatum*).—J. D. H.

G. purpureum, Br., a closely allied species, is given for Ceylon in Fl. B. Ind. vi. 16, but I do not know on what authority. It is probably only *dilatatum*.

G. fucatum, Lindl. in Bot. Reg. t. 1687 (1834) is said to have been sent from Ceylon by Mr. Watson in 1832, and, in Fol. Orch. Geod. 2, Lindley further quotes for it 'Walker in Herb. Hooker.' Thwaites never met with it, nor are any specimens now known; it seems from the figure to be merely a small state of *G. purpureum*.—*Trimen.*

It is impossible from dried specimens to distinguish *G. dilatatum*, *purpureum*, and *fucatum*. They are possibly all forms of one species.—J. D. H.

22. CYMBIDIUM, *Swartz.*

Epiphytes, pseudobulb 0; roots vermiform; stem very short, densely clothed with leaf-sheaths; l. long, linear, coriaceous, jointed on their sheaths; ped. from the axils of the leaf, loosely sheathed at the base, naked above, pendulous; fl. racemose, large, bracts coriaceous; sep. and pet. narrow, widely spreading; lip small, sessile on the base of the column, and embracing it by its side lobes, base saccate, mid lobe recurved, disk lamellate or ridged; column long, foot 0; anth. 1- or imperfectly 2-celled, pollinia 2, or 4, subglobose, waxy, sessile on a ½-lunar gland.—Sp. about 30; 15 in *Fl. B. Ind.*

L. loriform, tip 2-lobed . . . . 1. C. BICOLOR.
L. ensiform, tip acute . . . . 2. C. ENSIFOLIUM.

1. **C. bicolor,** *Lindl. Gen. and Sp. Orch.* 164 (1833).

C. aloefolium, Moon, Cat. 60 (non Sw.). Thw. Enum. 308. C. P. 3379. Fl. B. Ind. vi. 11. Wight, Ic. tt. 1687–8, *C. aloifolium* (not good). Bot. Mag. t. 387, *C. aloides.*

Stem short, very stout, clothed with broad, acuminate, membranous sheaths that embrace the leaf-bases; l. 2–3, 8–12 by $\frac{3}{4}$–1 in., loriform, coriaceous, tip unequally obtusely 2-lobed, sheaths 2–3 in., very stout, strongly acutely ribbed, green; ped. short, clothed with imbricating, acute sheaths; raceme 12–18 in., pendulous, laxly many-fld., rhachis stout, terete; bracts minute, ovate, pedicel with ov., $\frac{3}{4}$–1 in.; sep. 1 in., linear or oblong-linear, obtuse, reflexed; pet. about $\frac{1}{3}$ shorter, rather broader, erect, obtuse; lip about half as long as the sep., base saccate, side lobes short, acute, mid lobe small, nearly orbicular, revolute, with 2 calli at the base; column incurved, thickened upwards, foot very short; anth. hemispheric, pollinia 2, ovoid, sessile on a semilunar gland; fr. $2\frac{1}{2}$ in., narrowly pyriform.

Low country up to 3000 ft., on tree trunks; very common. Fl. March, April; sep. and pet. cream-coloured, more or less stained with reddish-purple down the middle, lip white with a purple blotch or veins and purple wings, ridges yellow.

Also in Southern India.

One of our commonest orchids. The great tufts of long leathery leaves and long pendulous racemes of flowers are very conspicuous, though of little beauty. There is a specimen of it in Kœnig's Herb. (Mus. Brit.) from Jafnapatnam, ticketed 'in truncis Borassorum.' Moon gives 'Wisaduli' as the Sinhalese name for this, but this is an error (see *Centipeda*, part iii. p. 42).

2. **C. ensifolium,** *Sw. in Nov. Act. Upsal.* vi. 77 (1799), var. **hæmatodes,** *Trim. Syst. Cat.* 89. [PLATE XC.]

C. hæmatodes, Lindl. Gen. and Sp. Orch. 162. Thw. Enum. 307. C. P. 3694.

Fl. B. Ind. vi. 13.

Stem very short, clothed with ovate-lanceolate brown sheaths; roots very many, vermiform, $\frac{1}{4}$ in. diam.; l. many, all radical, lowest short, membranous, conduplicate, upper 2–3 ft. by $\frac{1}{2}$–$\frac{2}{3}$ in., erect, ensiform, acute, 3–5-veined beneath, margins scaberulous; ped. from the base of the stem, with the many-fld. suberect raceme $1\frac{1}{2}$–2 ft., rhachis stout; bracts lanceolate, $\frac{1}{2}$–$\frac{2}{3}$ in., green, pedicel with ov. $1\frac{1}{2}$ in.; sep. $1\frac{1}{2}$ in. long, oblong, subacute, or obtuse, pet. subsimilar; lip about half as long as the sep., side lobes rounded, mid lobe as long as the side lobes, broadly ovate or orbicular, revolute; anth. hemispheric, pollinia 4, sessile in pairs on a semilunar gland, one of each pair much smaller; fr. $2\frac{1}{2}$ in., fusiform, bluntly trigonous.

Montane zone in open places to 5500 ft.; rather common. Hantane; Kondagula; Bogawantalawa, abundant. Fl. December, April; sweet-scented, sep. and pet. dull citron yellow, veined with pink, lip pale yellow, stained and spotted with dark pink.

In Sikkim, Khasia, China, and Japan.

In Fl. Brit. Ind., Lindley's *C. hæmatodes* is referred to *C. cyperifolium*,

Wall., and it is assumed that its author was mistaken in giving Ceylon (Macrae) as its locality. But, notwithstanding a few discrepancies in the description, I think our common plant is really intended. I have seen no good published figure; it should, perhaps, be kept distinct from *C. ensifolium* as a species.—*Trimen.*

There are two drawings of this plant in Herb. Peraden., one (PLATE XC. of this work) with oblong obtuse pale sep. and pet., with fine pink interrupted veins, lip white, spotted with blood red, mid lobe orbicular, and 4 small nearly globose pollinia, one of each pair much smaller than the other. The other drawing has ovate-lanceolate subacute pale straw-coloured sep. and pet., with 5 short red veins at the base of each, a straw-coloured lip, with red spots, and ovate mid lobe; the pollinia are 4, large, ovoid, and all equal. It is marked, in Thwaites's writing, '*C. hæmatodes*, Lindl. C. P. 3694.'—J. D. H.

C. aloefolium, Sw. This is given for Jaffna (Gardner) in Thw. Enum. 308, and the specimens (C. P. 754), which are not very good, have the flowers smaller and with rather broader sep. and pet., thus agreeing with Roxburgh's figure of *C. pendulum* (Cor. Pl. i. t. 44). Further examination of living specimens of this is necessary before deciding whether the plant is distinct from *C. bicolor.* Rolfe (in Herb. Kew) considers it to be true *C. aloefolium.* A specimen from Rottler (in Herb. Kew), without locality, is ticketed by him '*E. pendulum*, scapo-erecto.' The plant of Wight (Ic. t. 1687–8), from the Nilgiri Hills, has finely acuminate sep. and pet. —J. D. H.

23. **JOSEPHIA,*** *Wight.*

Epiphytes; stem very short, tufted, hardy, pseudobulbous, base clothed with reticulate membranous sheaths, roots vermiform; l. solitary, petioled, coriaceous, linear-oval or oblong; ped. much longer than the leaves, slender, paniculately branched, branches subsecund, with many small appressed coriaceous persistent empty bracts; fl. terminal or subterminal on the branches, bracts subulate, persistent, shorter than the pedicels; fl. rather small; sep. connivent, subequal, oblong, obtuse, concave, base subsaccate; pet. as long as the sep., oblong, obtuse; lip inserted on the base of the column, as long as the sep., base recurved, concave, side lobes short, rounded, incurved, mid lobe small, rounded, disk with a transverse membrane between the side lobes and mid lobe; column nearly as long as the sep., broad above, erect; anth. 2-celled, pollinia 4, narrowly pyriform, waxy, all attached by a short caudicle to a broad gland.—Sp. 2; both in *Fl. B. Ind.*

The following references of the two Ceylon species of *Josephia*, *J. lanceolata* and *latifolia* of Wight, involve a partial transposition of

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* Named in honour of Dr. (now Sir) Joseph Dalton Hooker, Director of Kew Gardens, 1865–85, and author of the 'Fl. Brit. India,' and many other standard books on botany.—*Trimen.*

the diagnostic characters which that author has given to them. According to Wight's figures these two species differ, in *J. lanceolata* having narrower long-petioled l. and orbicular sep.; *J. latifolia*, having broader short-petioled l., smaller fl., and oblong sep. These characters of flower and leaf are reversed in the Ceylon specimens of the Peradeniya Herbarium, and in excellent drawings of both species.

1. **J. lanceolata,** *Wight, Ic.* v. I. 19 (1851) (in part).
Thw. Enum. 307. C. P. 2358.
Fl. B. Ind. v. 823. Wight, Ic. t. 1742 (leaves only; for fl. see t. 1743).

L. 2–4 in., oblong-lanceolate or oblanceolate, obtuse or apiculate, very coriaceous, dull green, contracted at the base into a channelled petiole 1 in. long or less; ped. 6–8 in., very slender, branches spreading or deflexed; bracts $\frac{1}{12}$ in., subulate, coriaceous; pedicel with the ov. very short; sep. $\frac{1}{8}$–$\frac{1}{10}$ in. long, obtuse, 3-veined, dorsal oblong, lateral ovate-oblong, subacute; pet. linear-oblong, obtuse, 1-veined; lip with rounded side lobes, and subquadrately rounded mid lobe, saccate between the side lobes.

Lower montane zone, 3–5000 ft.; common. Fl. Aug.–Nov.; white tinged with purple, column purple.

Also in S. India.

Wight (citing Jerdon) says that the fl. are annually reproduced on the same inflorescence. The resemblance of the inflorescence to that of a *Statice* is striking.

2. **J. latifolia,** *Wight, Ic.* v. I. 19 (1851) (in part).
Fl. B. Ind v. 823. Wight, *Ic.* t. 1743 (leaves only; for fl. see t. 1742).

L. 2–3 in., oval or oblong, tip apiculate or 2-toothed, narrowed into a very short channelled petiole; ped. 4–6 in., branches slender, spreading; bracts minute, subulate, coriaceous; pedicel with the ov. $\frac{1}{10}$ in.; sep. $\frac{1}{6}$ in., 3-veined, orbicular, concave, lateral hardly saccate at the base; lip as in *J. lanceolata*, but more deeply saccate between the side lobes, and mid lobe more ovate.

Ramboda (Nock). Fl. Aug.; apparently deeper coloured than in *J. lanceolata.*

24. POLYSTACHYA, *Hook.*

Tufted epiphytes; stem. short or elongate, base pseudobulbous or a hard rootstock; roots vermiform; l. few, distichous, narrow, coriaceous, ribbed; ped. terminal, erect, clothed throughout, as is the rhachis of the panicle, with tubular membranous sheaths, branches of panicle forming many-fld. spikes or racemes; fl. small or minute, resupinate; bracts very small, ovate, persistent; sep. connivent, dorsal oblong, lateral triangular, inserted on the foot of the column; mentum conical; pet. very narrow, as long as the sep.; lip superior,

clawed, jointed on the foot of the column, 3-lobed, disk pubescent; column short, broad, foot rather long; anth. hemispheric, imperfectly 2-celled, pollinia 4, waxy, pyriform or subglobose, subsessile in pairs on a broad gland.—Sp. 40; 3 in *Fl. B. Ind.*

P. zeylanica, *Lindl. in Bot. Reg.* xxiv. *Misc.* 78 (1838).
P. luteola, Lindl. Gen. and Sp. Orch. 73; Thw. Enum. 308 (non Hook.). C. P. 2360.
Fl. B. Ind. vi. 21.

Stem rather stout, 6–10 in., base more or less swollen and hard, clothed with old leaf sheaths; l. few, alt., distichous, 4–8 by $\frac{1}{2}$–$1\frac{1}{4}$ in., oblong, linear-oblong, or oblanceolate, obtuse, many-veined, tip with a minute obtuse incurved tooth; ped. with panicle 6–10 in., branches 1–3 in., subsecund, striate, forming racemes 1–3 in. long, pedicels with ov. $\frac{1}{4}$ in.; sep. $\frac{1}{16}$–$\frac{1}{10}$ in. long; lip cuneate-obovate, side lobes small, acute, mid lobe rounded, disk furfuraceous; fr. $\frac{1}{2}$ in., fusiform.

Moist region to 4000 ft.; rather common. Peradeniya; Medulkelle. Fl.; pale yellow, tinged with pink.

Endemic.

P. Wightii, Rchb. f. of S. India is given doubtfully for Ceylon in Fl. B. Ind. It scarcely differs from *P. zeylanica* save in its smaller size, and is figured in Wight, Ic. t. 1678 (*P. luteola*).

25. SARCOCHILUS, *Br.*

Epiphytes; stem long short or o, pseudobulbs o; l. distichous, coriaceous; fl. usually small, racemose or spicate; sep. spreading, lateral adnate by a very broad base to the foot of the column; lip jointed or not, on the foot of the column, erect or incurved, clawed or not, saccate, sac various; column very short, foot long or short, rostellum beaked or not; anth. membranous, convex, imperfectly 2-celled, pollinia 2 or 4, waxy, globose or oblong, strap short or long, broad, gland small; fr. linear or sausage-shaped, usually long, straight, terete, with narrow ribs.—Sp. about 50; 36 in *Fl. B. Ind.*

Fl. inserted all round the rhachis of a spike or raceme.
  Fl. racemose.
    Lip sessile . . . . 1. S. WIGHTII.
    Lip long-clawed . . . . 2. S. VIRIDIFLORUS.
  Fl. in a very short terminal spike.
    L. flat . . . . 3. S. PULCHELLUS.
    L. semiterete . . . . 4. S. PUGIONIFORMIS.
Fl. distichous on a flattened rhachis . . . 5. S. COMPLANATUS.

1. **S. Wightii,** *Hk. f. in Fl. B. Ind.* vi. 37 (1890).
S. minimifolius, Hk. f. l. c. *Cymbidium minimifolium*, Thw. Mss. C. P. 4017.
Fl. B. Ind. vi. 37. Wight, Ic. t. 1741 (right-hand figure) (*Chiloschista usneoides*).

A dwarf, almost stemless epiphyte, leafless when flg., with many long flexuous flattened spreading compressed roots 6–8 in. long, appressed to the bark of trees; l. 2 (or more?) 1–1¼ in., linear-lanceolate, acuminate, channelled; ped. several, radical, 1–3 in. long, flexuous, pubescent, with a few rather distant subulate bracts, and 2 or 3 short tubular ones at the base; spike short, decurved, laxly 5–6-fld.; bracts as long as the ov., broadly ovate, acute, concave, membranous; pedicel with ov. pubescent; fl. about ⅓ in. broad; sep. and pet. spreading, 5-veined, tips rounded, dorsal sep. oval, lateral rather larger; pet. as long as the sep., but broader, inserted by a broad base on the foot of the column; lip sessile on the foot of the column, shorter than the sep., transversely oblong (when spread out) with rounded sides, base shortly saccate, sac conical, disk pubescent, with a thick scurfy obcordate callus at the broad sinus; pollinia 2, globose, sulcate, strap elongate cuneiform; fr. spreading, ⅓–½ in., sessile, sausage-shaped, terete, ribs slender.

Moist region, 1000–3000 ft.; apparently rare, on branches of trees; Peradeniya Gardens, frequent; Wattegodde, Hantane. Fl. March; sep. and pet. pale pink, lip yellowish, with minute red dots.
Also in S. India.

2. **S. viridiflorus,** *Hk. f. in Fl. B. Ind.* vi. 38 (1890).
Aerides viridiflorum, Thw. Enum. 430. C. P. 3835, 4016.
Fl. B. Ind. vi. 38.

Stem very short; roots long, stout, flexuous; l. 3–6, sessile, 2–3 by ⅔ in., all facing one way, falcately oblong or ovate, subacute, tip obliquely notched or rounded, veinless, base very shortly sheathing; ped. short, stout, ascending from near the base of the stem, with 2–3 short broad sheaths, spike 4–8-fld.; bracts much shorter than the ov., broadly ovate, obtuse, membranous, ov. ⅙–¼ in.; fl. nearly ½ in. across the sep.; sep. and pet. with rounded tips, dorsal sep. broadly oval, 3-veined, lateral much larger, adnate by a very broad base to the long foot of the column, 3–5 veined; pet. as long as the dorsal sep., linear-oblong, 1-veined; lip long-clawed, jointed on the foot of the column, carrying at the end of the claw a deep spur-like sac rounded at the base, and 2 oblong lobes, one on each side of the mouth of the sac, and with a marginal caruncled callus between them (in other words, claw ending in a semilunar limb with rounded cusps, a deep sac in the disk,

and a callus in the sinus); column much shorter than its foot; pollinia 4, pyriform, those of each pair closely appressed; fr. 1½ in., sessile, cylindric, straight.

Montane zone; very rare (?). Central Prov. (Gardner); above Dunsinane Estate, Gt. Western Mt. (Nevill). Fl. Feb.; sep. and pet. bright pale green, lip white.

Endemic. I have not seen Gardner's specimens (C. P. 3385), and C. P. 4016 are without locality.

3. **S. pulchellus,** *Trim. Syst. Cat. Ceyl.* 89 (1885).
Dendrocolla pulchella, Thw. Enum. 430. *Cylindrochilus pulchellus*, Thw. l. c. 307. C. P. 2354.
Fl. B. Ind. vi. 39.

Stem 2-3 in., erect, slender, rather flexuous; roots very long, slender, tortuous, branched; l. few, sessile, 2–2¾ in., linear-oblong or loriform, strict or falcate, thickly fleshy, tip rounded, obliquely 2-lobed; ped. longer than the l., greatly elongate in fr., slender, striate, with 1 or 2 minute sheaths; fl. ½ in. across the sep., in a very short terminal spike ⅙ in. long, with a thickened rhachis, bracts coriaceous, imbricate, acute, persistent, much shorter than the hardly pedicelled ov.; dorsal sep. oval, obtuse, 3–5-veined, lateral larger, oblong-ovate, subacute, 5-veined, adnate by a rather narrow base to the foot of the column; pet. oblanceolate, obtuse, 1-veined; lip shorter than the sep., shortly clawed on the foot of the column, semi-orbicular when spread out, with a deep broad sac on the disk, broadly truncate in front, surface pubescent, with a thick scurfy callus between the mouth of the sac and outer margins, outer angles acute; pollinia 2, orbicular, 2-partite, compressed, strap very short, gland small, orbicular; fr. 2–3 in. long, subsessile, slender, straight, base and tip narrowed.

Moist low country to 2000 ft.; rather common. Peradeniya Gardens, wild on trees; Hantane; Kaduganawa; Kurunegala; Heneratgoda. Fl. April–June; pure milk-white, lip tinged and spotted with orange.

Endemic. A very pretty little plant when in full flower, formerly frequent on the stems of the coffee bushes on estates.

4. **S. pugionifolius,** *Hk. f. in Fl. B. Ind.* vi. 196 (1890).
Hook. Ic. Plant. t. 2125, f. B.

Stem very short, compressed; roots tortuous, simple; l. few, 1½–2 in., elongate-subulate, acuminate, thickly coriaceous, deeply channelled on the upper surface, tip setaceous, green, sheath very short; ped. shorter than the l., rather stout, green dotted with red; fl. about ¼ in. across the sep., in a very short terminal spike, with a thickened rhachis and small coriaceous acute persistent bracts; sep. subacute, dorsal oblong, 3-veined, lateral much larger, adnate by a rather narrow base to the

short foot of the column, 5-veined; pet. linear-oblong, obtuse, 3-veined; lip very shortly clawed, sessile on the foot of the column, shorter than the sep., transversely oblong when spread out, obscurely 3-lobed in front, with a scurfy callosity on the margin in the middle, deeply saccate on the disk, sides rounded, surface pubescent; sac broad, incurved, 2-lobed; column with a short broad foot.

Dry region, on branches of trees; rare. Samanturai, E. Prov., and Varuniya Vilankulam, N. C. Prov. (Nevill). First collected by Mr. Nevill at Samanturai in 1885.

Fl. August; sep. and pet. pale sulphur-yellow, lip nearly white, with a few orange dots and lines. Leaves and peduncle minutely dotted with purple.

Endemic.

5. **S. complanatus,** *Hk. f. in Fl. B. Ind.* vi. 41 (1890). *Epidendrum complanatum*, Retz. Obs. vi. 50. *Liparis serræformis*, Lindl. Gen. and Sp. Orch. 33 (in part). *Dendrocolla serræformis*, Thw. Enum. 306. *Sarcochilus serræformis*, Trim. Syst. Cat. Ceyl. 89 (non Rchb. f.). C. P. 3209.

Fl. B. Ind. vi. 41.

Stem 6–12 in., stout, curved or tortuous, copiously rooting; roots very long, simple; internodes $\frac{1}{3}$–$\frac{1}{2}$ in., clothed with the short leaf-sheaths; l. 2–7 by $\frac{1}{2}$–$\frac{2}{3}$ in., loriform, coriaceous, tip obtuse or unequally 2-lobed; ped. 1–3 in., stout, leaf-opposed, with few short obtuse coriaceous sheaths; raceme 1–5 in., flattened, pectinate with distichously imbricating oblong obtuse coriaceous laterally compressed incurved bracts $\frac{1}{8}$ in. long; sep. and pet. very long, membranous, narrowed from the base into caudiform tips, sep. $\frac{3}{4}$ in. long, 5-veined, lateral adnate by a broad base to the foot of the column; pet. narrower, rather shorter, 3-veined; lip small, sessile, jointed on the foot of the column, saccate, nearly semicircular when spread out, shallowly 3-lobed in front, side lobes subacute, mid lobe thickened, disk with a prominent styliform callus, basal sac conic; column very short indeed, foot broad, not long; anth. depressed, 2-celled, pollinia 4, in pairs, one of each pair shortly oblong, the other very much smaller, closely appressed to it, each attached by a very short caudicle to a semilunar gland; fr. 2–3 in. by $\frac{1}{3}$ in. diam., linear, straight, narrowed at both ends, very shortly pedicelled.

Low country to 3000 ft.; rare. Ambagamuwa Dist.; Ratnapura; summit of Ritigala, N. C. Prov.; Kalutara. Fl. September; pale yellow, the lip nearly white, with a red blotch near the end.

Endemic.

The form of the inflorescence is much like that of *Liparis disticha*. This is (according to Fl. B. Ind.) *Epidendrum complanatum*, Retz. Obs. Bot. vi. 50, as shown by a specimen, unfortunately not localised, in Herb.

Rottler. Judging from the coloured figures in Herb. Perad., we have also in Ceylon *S. Arachnites*, Rchb. f.—*Trimen.*

S. Arachnites is a Malayan species, with larger fl. than *S. complanatus*, and caudately acuminate sepals and petals. Probably the figures alluded to were made from imported specimens. The genus *Dendrocolla*, Bl., should perhaps be maintained for the species of *Sarcochilus* with an infl. of distichous, persistent, fleshy bracts, and the lip jointed on to the base or foot of the column.—J. D. H.

26. RHYNCHOSTYLIS, *Bl.*

Epiphytes; stem very stout, leafy above, pseudobulb 0; l. long, sessile, distichous, linear, præmorse, keeled, thickly coriaceous; fl. densely crowded in a shortly peduncled long cylindric drooping raceme; sep. and pet. spreading, very obtuse, dorsal sep. smallest, ovate-oblong, erect, lateral much larger, obliquely orbicular-ovate, adnate by a narrow base to the short foot of the column; pet. obovate-oblong; lip broadly clawed, claw deflexed, deeply saccate or spurred beyond the claw, side lobes minute or 0, mid lobe inflexed, elongate, narrowly cuneiform, disk fleshy, tip 2-lobed, sac or spur as long as the claw, deep, broad, laterally compressed, tip rounded, puberulous within; column erect, subclavate, rostellum shortly beaked, foot short; anth. hemispheric, imperfectly 2-celled, pollinia 2, pyriform, waxy, sulcate, caudicle slender, gland small; fr. clavate.—Sp. 2 or 3; 1 in *Fl. B. Ind.*

R. retusa, *Bl. Bijd.* 286 (1825).

Saccolabium guttatum, Lindl., Thw. Enum. 303. C. P. 2344.

Fl. B. Ind. vi. 32. Bot. Reg. t. 1443 (*Sarcanthus guttatus*). Bot. Mag. t. 4108 (*Saccolabium*). Wight, Ic. t. 1745–6 (*Saccolabium*).

Stem 2–10 in., as thick as the middle finger, hard, leafless below; roots many, very stout, branching, 6–10 in. long, and as thick as a swan's quill; internodes short, clothed with brown leaf-sheaths; l. 6–20 by $\frac{2}{3}$–2 in., loriform, spreading and recurved, obliquely præmorse and toothed, or unequally 2-lobed, one lobe rounded, the other truncate, bases closely imbricating; raceme very shortly stoutly peduncled, 8–10 in. long by $1\frac{1}{2}$ in. diam., very dense-fld.; bracts very small; ov. with the very short pedicel, $\frac{1}{4}$ in. long; fl. $\frac{1}{2}$–$\frac{2}{3}$ in. broad, sep. and pet. many-veined, all broad, dorsal sep. broadly ovate-oblong, lateral twice as large; pet. as large as the dorsal sep.; margins of mid lobe of lip recurved; fr. 1–$1\frac{1}{2}$ in., stoutly shortly pedicelled, clavate, acutely 3-angled and 6-ribbed.

Dry region, on trees; rather rare, but locally abundant. Bintenne; about Bibile, frequent; Batticaloa; near Ragam Tank, abundant. Fl.

Nov.–April, July; white, more or less dotted with violet-pink, lip strongly tinged with the same colour.

Indian Peninsula, Trop. Himalaya, Malay Islands.

Called 'Fox-tail Orchid' or 'Batticaloa Orchid' by the English residents. The most beautiful of our native species.

27. **DORITIS,** *Lindl.*

Epiphytes; stem short, stout, leafy, pseudobulb 0; l. sessile, distichous, broad, coriaceous; ped. leaf-opposed, simple or paniculately branched, flexuous, few-fld.; sep. and narrower pet. spreading, obovate or oblong, lateral sep. adnate to the foot of the column, oblong, subfalcate; mentum short, conical; pet. as long, linear-oblong; lip shortly clawed, 3-lobed, disk with a bicuspidate callus; column short, broad, margins winged, foot 0; anth. low, acuminate, 2-celled, pollinia 2, waxy, strap long, slender, gland small.—Sp. 6; 2 in *Fl. B. Ind.*

D. Wightii, *Benth. in Gen. Plant.* iii. 574 (1883).

D. latifolia, Trim. Syst. Cat. Ceyl. 89 (1885). *Phalænopsis Wightii*, Reichb. f. *Aerides latifolia*, Thw. Enum. 429. C. P. 3495.

Fl. B. Ind. vi. 32. Ann. Bot. Gard. Calcutt. v. t. 59, and viii. t. 265.

Stem very short, clothed with green leaf-sheaths, emitting long vermiform roots; l. jointed on the sheaths, 4–7 by $1\frac{1}{2}$–$2\frac{1}{2}$ in., obovate to oblong-lanceolate, obtuse or cuspidate, coriaceous, keeled beneath, margins undulate, sheath very short; ped. one or more, simple or branched, with the panicle 6–18 in. long, flexuous, green, spotted with red, branches few, 3–4 in., spreading, forming strict racemes with a stout rhachis; bracts minute, pedicels with ov. $\frac{1}{6}$–$\frac{1}{4}$ in.; sep. $\frac{1}{6}$ in. long, obtuse, dorsal linear-oblong, lateral rather broader; pet. rather narrower; side lobes of lip spreading, mid lobe obcordate, cusps of calli pointing forward.

Moist region below 1000 ft.; rare. Hiniduma; near Ratnapura. Fl. September; sep. and pet. white, lip veined with violet or pink.

S.W. India, E. Himalaya, Burma.

There are two drawings of this plant in Herb. Perad.: one (C. P. 3495) has a solitary, oval, apparently coriaceous, very dark green leaf, spotted with red, about 4 by $1\frac{1}{2}$ in., and a simple dull blue ped. terminating in a raceme; the other represents a much larger plant, with 4 leaves, the largest $7\frac{1}{2}$ by $1\frac{1}{2}$ in., very pale green, with conspicuous veins and cross-venules, margins waved; the ped. is branched, green, spotted with red, and with the panicle 16 in. long, it has narrower sep. and pet. than the other.—J. D. H.

28. **AERIDES,** *Lour.*

Epiphytes; stem elongate, leafy, rooting; l. lorate or terete, coriaceous; fl. few or many, in lax or dense-fld. decurved leaf-opposed racemes or panicles; sep. broad, spreading, adnate to

the base or foot of the column; pet. broad, spreading; lip deeply saccate or spurred, side lobes various, larger or smaller than the mid lobe; column short, foot long or short, rostellum 2-fid.; anth. 2-celled, pollinia 2, globose, waxy, channelled, strap long or short, gland large or small.—Sp. about 60; 18 in *Fl. B. Ind.*

L. terete . . . . 1. A. CYLINDRICUM.
L. lorate . . . . 2. A. LINEARE.

1. **A. cylindricum,** *Lindl. in Wall. Cat.* n. 7317 (1828).
Thw. Enum. 306. C. P. 2348.
Fl. B. Ind. vi. 44, 196. Wight, Ic. t. 1744.

Stem. 1–2 ft., as thick as a goose quill, sending out long strong flexuous simple roots; internodes 1–2 in., sheaths green, speckled with red; l. 2–6 in., terete, as thick as a crow-quill or rather thicker, tip very obliquely truncate, acute, coloured like the sheaths; ped. 1½–2 in., stout, with a short tubular basal sheath, and a short obtuse one about the middle, 2–4-fld., bracts very short, coriaceous; fl. 1½ in. broad, pedicel with ov. 1 in., slender; sep. and pet. all broad with rounded tips, many-veined, dorsal sep. oval, lateral smaller, base narrowed; pet. oval, larger than the dorsal sep., attached by a very broad base to the foot of the column; lip shorter than the sep., sessile on the foot of the column, funnel-shaped, 3-lobed, side lobes oblong, obtuse, erect, mid lobe rather longer, recurved, tongue-shaped, obtuse, disk ridged, base of funnel acute, straight or incurved; column stout, incurved, truncate, rostellum obtuse; anth. depressed, 2-celled, pollinia globose, strap short, broad, gland semilunar; fr. 2 in., fusiform or subclavate, ribs strong, acute, pedicel ½ in., stout, striate.

Moist region at about 3000 ft.; rather rare. Hantane; Ramboda. Fl. Feb.–May; creamy-white, lip with the lateral lobes finely lined with pink within, and the central lobe yellow, with red spots at the tip.

Also in S. India.

The foliage is much like that of *Luisia teretifolia.*

The lip is that of a *Vanda*, from which genus *Aerides* differs in the foot of the column. The attachment of the pet. to the foot of the column by a much broader base than do the lateral sepals is a peculiar character. —J. D. H.

2. **A. lineare,** *Hk. f. in Fl. B. Ind.* vi. 46 (1890).
Saccolabium paniculatum, Wight; Thw. Enum. 429. C. P. 3769.
Fl. B. Ind. vi. 47. Wight, Ic. t. 1676.

Stem short, as thick as the thumb, with very stout simple vermiform roots; l. 6–12 by ½–¾ in., scymitar-shaped, unequally 2-lobed, sides complicate, thickly coriaceous, keeled, bases closely imbricating; fl. secundly racemose on the long

spreading branches of a shortly stoutly peduncled panicle 12–18 in. long, $\frac{3}{4}$ in. long from the tip of the dorsal sepal to that of the spur, bracts very small, triangular, acute, persistent, pedicel with ov. $\frac{1}{2}$–$\frac{2}{3}$ in., decurved; sep. and pet. all broad, reticulately many-veined, dorsal sep. oval, lateral larger, broadly ovate, adnate by a very broad base to the long foot of the column; pet. larger than the dorsal sep., obovate; lip sessile on the foot of the column, 3-lobed, side lobes small, rounded, bordering the mouth of the large subclavate sac or spur, mid lobe broadly ovate, acute, flat, many-veined, base with a fleshy rounded callus at the mouth of the sac; column very stout, foot with a long, broad, deep channel leading into the sac of the lip, and raised fleshy sides, rostellum shortly beaked; anth. depressed, imperfectly 2-celled, pollinia globose, sulcate, strap short, broad, gland large, cleft; fr. $\frac{1}{2}$–1 in., pyriform, ribs thick, pedicel stout, decurved.

Low country, below 2000 ft.; rather rare. Dumbara; Nelande; near Bibile; Seven Korales Dist. Fl. Sept., Oct.; white, with a blush of pale pink.

Also in S. India.

29. **LUISIA,** *Gaud.*

Epiphytes; stem rigid, terete, simple or branching, not pseudobulbous; roots vermiform; l. elongate, terete, obtuse; fl. spicate on a short axillary ped., rather small, drooping; bracts short, thick, persistent; sep. spreading or incurved; pet. narrower, but as long or longer; lip inserted on the base of the column, entire or obscurely 3-lobed; column very short, truncate, foot 0; anth. 2-celled, pollinia 2, globose or pyriform, waxy, strap short, flat, its margins replicate, gland broad; fr. narrow, erect.—Sp. about 15; 14 in *Fl. B. Ind.*

Lip with a broadly obcordate short terminal lobe . 1. L. TERETIFOLIA.
Lip panduriform, tip with two divergent lobules . 2. L. TENUIFOLIA.

1. **L. teretifolia,** *Gaud. Bot. Freyc. Voy.* 427 (1826).

Cymbidium triste, Lindl. Gen. and Sp. Orch. 167 (non Willd.). *L. zeylanica*, Lindl. Fol. Orch. Luisia, 3; Thw. Enum. 302. C. P. 2347 (part).

Fl. B. Ind. vi. 22. Wight, Ic. t. 1689 (*Cymbidium tenuifolium*). Bot. Mag. t. 3648 (Cymb. triste). Ann. Bot. Gard. Calcutt. viii. t. 271.

Stem 6–12 in., about as thick as a swan's quill, with stout branching vermiform roots; internodes $\frac{1}{2}$–$\frac{3}{4}$ in.; l. 4–7 in., as thick as a crow's quill; green, purple-spotted, tip rounded; ped. with rhachis of few-fld. spike 1–2 in., ov. very short; bracts minute; sep. $\frac{1}{2}$ in., dorsal oblong or linear-oblong, lateral broader, spreading, subacute, with a dorsal winged keel; pet. as long as the sep., linear-oblong, obtuse; lip rather

longer than the sep., base (or hypochile, quadrate, saccate, shorter and narrower than the broadly cordate, obtuse, obscurely 3-lobed fleshy limb (or epichile); fr. ¾–1½ in.

Moist region to 4000 ft.; on trees, rather common. Hantane. Fl. April; sep. and pet. pale purplish-yellow, base of lip green, spotted with purple, tongue dark purple.

Also in S. W. India, E. Bengal, Burma, Malaya, Polynesia.

2. **L. tenuifolia,** *Bl. Rumphia*, iv. 50 (1848).

Lindl. Fol. Orch. Luisia 2; Thw. Enum. 302. *Cymbidium tenuifolium*, Lindl. Gen. and Sp. 167 (non Willd.). C. P. 3530, 2347 (part).

Fl. B. Ind. vi. 24. Wight, Ic. t. 911 (*Cymbidium triste*).

Stem 12 in. or more, slender; l. 4–7 in., more slender than the stem, green, spreading, straight or flexuous, tip rounded; ped. with rhachis of spike ½ in.; fl. few, bracts minute, persistent; sep. ⅜ in. long, dorsal oblong, obtuse, lateral ovate-oblong, subacute, concave; pet. linear, obtuse, from one third longer to twice as long as the lateral sep.; lip longer than the sep., narrowly panduriform, convex, base broad, 2-auricled, tip with 2 divergent lobules.

Low country of moist region to 3000 ft.; rather rare. Hantane. Fl.; sep. and pet. pale yellowish-purple, lip dark purple, with a broad white patch on either side, the terminal lobes pale purple.

Also in S. W. India.

The Fl. B. Ind. quotes for this C. P. 2347, which is chiefly *L. teretifolia*, and (p. 26) refers C. P. 3530, which is correctly given by Thwaites as *L. tenuifolia*, to 'probably a new species near *filiformis*.' We have only two species in Ceylon.—*Trimen.*

The numbers were mixed in Herb. Kew, and the specimens very indifferent. Judging from the drawings in Herb. Peraden., C. P. 3530 is, no doubt, *L. tenuifolia*.—J. D. H.

30. **VANDA,** *Br.*

Epiphytes; stem long with vermiform roots; pseudobulb 0; l. distichous, recurved, thickly coriaceous, linear, concave above, keeled, præmorse or 2-lobed; fl. large or medium-sized, in peduncled stout leaf-opposed racemes or panicles; sep. and pet. subequal, spreading, bases narrowed, lateral sep. inserted on the base of the column; lip smaller than the sep., adnate to the base of the column, funnel-shaped, 3-lobed, side lobes erect, close to the column, mid lobe erect or recurved, narrow or broad, spur (base of the funnel), conical, subacute, straight or recurved; column short, stout, foot 0; rostellum obscure; anth. 2-celled, pollinia 2, globose or oblong, waxy, strap short, gland large.—Sp. about 20; 19 in *Fl. B. Ind.*

L. 6–10 in.
- Side lobes of lip obtuse . . . . . 1. V. PARVIFLORA.
- Side lobes of lip acute . . . . . . 2. V. ROXBURGHII.

L. 2–4 in.
- Ped. very short . . . . 3. V. THWAITESII.
- Ped. very long . . . . 4. V. SPATHULATA.

1. **V. parviflora,** *Lindl. Bot. Reg.* xxx. *Misc.* 45 (1844).

Aerides Wightianum, Lindl. in Journ. Linn. Soc. iii. 40; Thw. Enum. 305. *A. testaceum*, Lindl. Gen. and Sp. Orch. 238. C. P. 752.

Fl. B. Ind. vi. 50. Wight, Ic. t. 1669. Bot. Mag. t. 5138. Ann. Bot. Gard. Calcutt. viii. t. 286.

Stem very stout, 4–6 in., leafy; roots very large, vermiform, up to ½ in. diam.; l. 4–8 by ½–¾ in., lorate, straight or recurved, very unequally 2–3-lobed or toothed, lower lobe sometimes ½ in. below the upper, sides complicate, thickly coriaceous, keeled, sheaths closely imbricate; ped. erect, 8–10 in., rather stout, green marbled with red; raceme 3–6 in., erect, laxly many-fld.; bracts minute, ovate, pedicel with ov., 1–1½ in.; fl. 1–1¼ in. across the sep., sep. and pet. obovate-spathulate, many-veined and reticulate; lip rather shorter than the sep., sessile, 3-cleft to below the middle, side lobes oblong, obtuse, erect, mid lobe rather longer, recurved, subquadrately obovoid, tip dilated, crenulate, truncate, or retuse, disk with 2 broad fleshy ridges, spur narrowly funnel-shaped with an incurved tip, column very short; anth. depressed, pollinia globose, strap linear, gland orbicular; fr. 1½–2 in., fusiform, or narrowly pyriform, erect, ribs acute, pedicel ½–¾ in., stout.

Low moist country up to 3000 ft.; rather common. Galle (Champion); about Peradeniya. Fl. March; sep. and pet. cream-coloured, lip white, with purple markings.

S.W. India, W. Himalaya, Burma.

The Bot. Mag. figure shows much more brightly coloured flowers.

2. **V. Roxburghii,** *Br. in Bot. Reg.* vi. t. 506 (1820).

Thw. Enum. 303. C. P. 2346.

Fl. B. Ind. vi. 52. Bot. Reg. t. 506. Wight, Ic. t. 916.

Stem 1–2 ft., stout, scandent by the stout simple and branching roots; internodes short, lower with brown sheaths; l. 6–8 in., narrow, recurved, complicate, obtusely keeled, thickly coriaceous, præmorse with usually 2 unequal rounded lobes and a short acute interposed one, sheaths closely imbricate; ped. with the raceme 6–8 in., 6–10-fld., stout, green, with a few distant empty short sheaths; bracts minute, ped. with ov. 1½–2 in.; fl. 2½ in. broad, sep. and pet. subequal, obovate, clawed, more or less waved, lateral sep. largest; lip small, funnel-shaped, side lobes small, erect, acute, mid lobe panduriform, constricted below the bifid tip, disk tumid with

fleshy ridges, spur (base of funnel) short, conical, obtuse; column very short; pollinia oval or subglobose, strap very short, broad, gland large; fr. 3–3½ in., narrowly clavate, ribs acute, pedicel very short.

Dry region, on trees; rather common. Jaffna; Batticaloa; Anuradhapura; Maradankadawala, abundant; Puttalam. Fl. March–August; sep. and pet. pale buff or grey tessellated with brown lines, margins white; lip greyish-blue, dotted with purple.

Peninsular India, Bengal, Burma.

A beautiful sweet-scented Orchid, the colouring of the flowers very unusual in the family.

3. **V. Thwaitesii,** *Hook. f.* (nov. sp.)
Aerides tessellatum, Thw. Enum. 305 (non Wight). C. P. 3378.

Stem 6–12 in., as thick as the little finger; lower internodes covered with short brown coriaceous sheaths; l. 3–4 in. long, falcately recurved, complicate, thickly coriaceous, tip 2-fid., sheaths closely imbricating; raceme with the stout ped. 4 in., green, 2–3-fld.; bracts very small, pedicel with ov. 1 in.; fl. 1½ in. broad, sep. very obtuse, dorsal obovate-oblong, lateral larger, orbicular-obovate; pet. as large as the dorsal sep., obovate-oblong; lip shorter than the sep., sessile on the base of the column, funnel-shaped, side lobes small, erect, mid lobe broadly ovate, tip retuse or 2-lobulate, spur (base of funnel) shorter than the lobes, straight, acute; column short, stout, rostellum truncate; anth. depressed, 2-celled, pollinia 2, obovoid, sulcate, strap short, subulate, gland large, orbicular.

Hunasgiria District (Alwis). Fl.; yellow-green, streaked and spotted with red, lip white or pale yellow.

Endemic.

Of this fine species there are two drawings by Alwis in the Peradeniya Collection, from one of which the description by Thwaites in his 'Enumeratio' was taken. There are no specimens in the Herbarium.

4. **V. spathulata,** *Spreng. Syst. Veg.* iii. 719 (1826).
Cymbidium spathulatum, Moon, Cat. 60. Thw. Enum. 303. C. P. 2345. Fl. B. Ind. vi. 50. Wight, Ic. t. 915.

Stem about 1 ft., leafy, thicker than a swan's quill, rooting upwards; roots very stout, vermiform; internodes 1 in., green; l. 2–4 by 1¼–1½ in., lorate, keeled, recurved, flat, tip rounded emarginate or 2-lobed, lower l. sometimes smaller, ovate, sheath green, speckled with red; ped. from the middle or lower nodes, 12–18 in., erect, robust, with a few distant short, acute sheaths, green, speckled with red; raceme terminal, 4–5-fld., rhachis stout, bracts broadly ovate, acuminate, pedicel with ov. 1–1½ in., fl. 1¼–1½ in. broad; sep. and pet. obovate-oblong, tips rounded; lip longer than the sep., side lobes small, oblong, erect, mid lobe much larger, shortly clawed, triangular-ovate, tip contracted, obtuse, spur very short,

conical; column very short, rostellum obscure; anth. depressed, truncate, pollinia oblong, strap short, spathulate, gland large, 2-fid; fr. 1½ in., obovoid, erect, ribs thick, pedicel 1 in., very stout.

Low country below 2000 ft., on bushes and rocks; rather common, especially in the dry and intermediate districts. Fl. March–September; entirely bright deep chrome yellow.

Also in S.W. India.

A striking species, the long erect peduncles carrying the flowers high above the bushes over which the plant climbs.

31. DIPLOCENTRUM, *Lindl.*

Epiphytes; stem short, pseudobulb 0; roots long, stout; l. distichous, narrow, fleshy, subterete or complicate; peduncle lateral, branched; fl. small, subspicate on the spreading branches; sep. spreading and incurved, dorsal oblong, lateral larger; pet. like the dorsal sep.; lip rather longer than the sep., tongue-shaped, jointed on the base of the column, entire; shortly 2-spurred at the base, disk fleshy, spurs short, collateral; column very short, clavate, 2-auricled, truncate, foot 0; anth. flat, ovate, obtuse, 2-celled, cells very small, at the broad end of the anth., pollinia 2, small, sulcate or 2-partite, waxy, strap very large and broad, gland broad.—Sp. 2 or 3; 2 in *Fl. B. Ind.*

D. recurvum, *Lindl. in Bot. Reg.* xviii. *sub* t. 1522 (1832).

Thw. Enum. 306. C. P. 3192.

Fl. B. Ind. vi. 78. Wight, Ic. tt. 1680, 1681 (*D. longifolium* and *D. recurvum*).

Stem 2–6 in., densely leafy, very stout; internodes short; roots very long, flattened; l. 4–6 by ¼–⅓ in., linear, recurved, coriaceous, keeled, unequally obtusely 2-fid; panicle 5–8 in. long, shortly peduncled, curved, branches few, long, spreading and decurved, many-fld.; fl. about ⅙ in. broad; bracts minute, acute, deciduous; dorsal sep. oblong, obtuse, lateral larger, falcately broadly oblong, 3-veined; pet. like the dorsal sep., 1-veined; lip ovate-oblong, side lobes obscure, disk fleshy, excavate, with a median ridge, spurs short, conical, acute, incurved; auricles of column incurved; anth. truncate, cells minute, basal; strap of pollinia large, cuneiform, narrowed from the broad base upwards to the insertion of the minute pollinia; fr. ½ in., clavate, strongly ribbed, stoutly pedicelled.

Moist region; very rare. The only specimens were collected by Gardner somewhere in the Central Prov., but have no locality attached. Fl. described as pink, with a darker spur.

Also in S. India.

32. SACCOLABIUM, *Bl.*

Epiphytes of various habit; stem usually simple, pseudobulb 0; l. various, semi-terete, or lorate and keeled, articulate on a short sheath; fl. minute or small, racemose or panicled on a leaf-opposed ped.; sep. and pet. subsimilar, inserted with the lip on the base of the column; lip a sac or spur with small lobes, not septate within, but with sometimes a large scale or callus within it below the column; column short, stout, foot 0; anth. 1- or imperfectly 2-celled; pollinia 2, entire or bipartite, waxy, strap broad or narrow, gland large. Sp. about 60; 47 in *Fl. B. Ind.*

L. semi-terete or filiform.
  Fl. in slender panicles . . . . . . 1. S. NIVEUM.
  Fl. in short racemes . . . . 2. S. FILIFORME.
L. flat or channelled.
  Lip spurred.
    L. $\frac{1}{3}$–4 in. long.
      Raceme slender, many-fld. . . . . . 3. S. GRACILE.
      Raceme short.
        Stem stout . . . . 4. S. BREVIFOLIUM.
        Stem slender . . . . 5. S. ROSEUM.
    L. 7–9 in. long . . . . 6. S. OCHRACEUM.
  Lip saccate.
    Mid lobe of lip fimbriate . . . . 7. S. ACAULE.
    Mid lobe of lip entire.
      L. 6–12 in. long . . . . 8. S. LONGIFOLIUM.
      L. 4–6 in. long . . . . 9. S. WIGHTIANUM.

1. S. niveum, *Lindl. Gen. and Sp. Orch.* 224 (1833).
Thw. Enum. 304. C. P. 2340.
Fl. B. Ind. vi. 55.

Stem 5–6 in., as thick as a goose-quill curved, clothed below with sheaths; internodes very short; l. 2–4 by $\frac{1}{6}$–$\frac{1}{4}$ in., distichous, spreading and recurved, linear, fleshy, concave, dorsally rounded, tip notched, speckled with red; panicle 4–5 in., leaf-opposed, ped. short and rhachis green, branches few, 2–4 in., spreading, spiciform, bracts minute, acute, brown; fl. about $\frac{1}{12}$ in. long, resupinate, dorsal sep. broadly oblong, subacute, 1-veined, lateral dorsally thickened; pet. narrower, cuneate-oblong; lip longer than the sep., obtusely 3-lobed, saccately spurred, side lobes narrow, rounded, mid lobe spathulate, fleshy, concave, spur shorter than the lip; anth. hemispheric, pollinia 4, oblong, 2 much smaller, strap short, broad, flat, gland very large; fr. $\frac{1}{6}$–$\frac{1}{4}$ in., clavate or subglobose, pedicelled, spreading and decurved.

Montane zone, 3–6000 ft., on trees; rather common. Fl. July, Sept., Oct.; white.
Endemic.

2. **S. filiforme,** *Lindl. in Journ. Linn. Soc.* iii. 36 (1859).
Schœnorchis juncifolia, Thw. Enum. 304 (non Bl.). C. P. 633.
Fl. B. Ind. vi. 56. Wight, Ic. t. 1684 (*Sarcanthus filiformis*).

Stem 6–12 in., about as thick as a crow-quill, terete, purple-spotted, strongly curved, rigid, simple, naked below; internodes $\frac{1}{2}$–$\frac{3}{4}$ in.; roots long, stout, terete or flattened; l. 3–5 in., about as thick as the stem, acute; raceme $1\frac{1}{2}$–2 in., very shortly peduncled, simple, dense-fld., rhachis stout; bracts minute, lanceolate, pedicel with ov. $\frac{1}{4}$ in., erect; fl. $\frac{1}{4}$ in. long, sep. obtuse, 3-veined, dorsal ovate-lanceolate, erect, lateral linear; pet. $\frac{1}{3}$ in., shorter than the sep., broadly oval, obtuse, 3-veined; lip a large inflated spur longer than the sep., base rounded, side lobes erect, rounded, mid lobe small, ovate, deflexed; column with 2 erect curved arms; anth hemispheric, pollinia 2, globose, yellow, strap narrow, dilated upwards, gland very large; fr. $\frac{1}{4}$ in., turgidly pyriform, pedicel as long, spreading.

Montane zone, 4–6000 ft., on trees; rather common. Fl. May; yellow, sep. and pet. with orange veins.
Also in S. India.

3. **S. gracile,** *Lindl. Gen. and Sp. Orch.* 225 (1833).
Thw. Enum. 304. C. P. 2528.
Fl. B. Ind. vi. 57.

Stem 2–8 in., as thick as a crow-quill, flexuous or zigzag; internodes $\frac{1}{4}$–$\frac{1}{2}$ in.; roots very slender, flexuous; l. $2\frac{1}{2}$–4 by $\frac{1}{3}$ in., elongate linear-lanceolate, acuminate, flat, straight or falcate, narrowed at base and tip, midrib obscure; racemes 4–6 in., pendulous, ped. and rhachis very slender, many-fld., bracts minute, subulate, pedicel with ov., $\frac{1}{10}$ in.; fl. $\frac{1}{4}$ in. long; sep. broadly oblong, obtuse, 1-veined, lateral larger; pet. rather narrower, oblong, obtuse, 1-veined; lip a long sub-incurved obtuse spur, three times as long as the sep., side lobes 0, mid lobe very small, lanceolate; anth. depressed, long-beaked, pollinia 2, globose, strap very slender, gland not seen; fr. globose, $\frac{1}{6}$ in. diam., pedicel $\frac{1}{12}$ in., slender.

Montane zone, about 4000 ft.; very rare. Hantane; Horton Plains. Fl. July, May; white.
Endemic.

4. **S. brevifolium,** *Lindl. Gen. and Sp. Orch.* 225 (1833).
Lindl. in Journ. Linn. Soc. iii. 35. Thw. Enum. 304. C. P. 2341, 488.
Fl. B. Ind. vi. 57.

Stem 6–10 in., stout or slender, scandent; internodes $\frac{1}{2}$–$\frac{3}{4}$ in.; roots very slender; l. distichous, $\frac{1}{3}$–$\frac{1}{2}$ in., linear-oblong, channelled along the centre, coriaceous, unequally 2-lobed; raceme 1–$1\frac{1}{2}$ in., shortly peduncled, recurved, few- or many-

fld., ped and rhachis slender, bracts very minute; fl. ½ in. long; sep. and pet. subequal, incurved, orbicular-ovate; lip a nearly straight laterally compressed obtuse spur, three times as long as the sep., side lobes 0, mid lobe a minute tooth; anth. depressed, cuspidate in front, pollinia globose, purple, strap very slender, gland large, oblong, bifid.

Forests throughout montane zone; common. Fl. Feb.–April, Sept.; deep purple-red, the lip yellow at the upper part, variable in the length and thickness of the leaves. A form with the fl. greenish-white (*S. virescens*, Gardn. MSS.) is frequent.
Endemic.

5. **S. roseum,** *Lindl. Gen. and Sp. Orch.* 225 (1833).
Sarcanthus Walkerianus, Wight, Ic. v. 1, 11. *S. Walkerianum*, Rchb. f. in Walp. Ann. vi. 887. Thw. Enum. 304. C. P. 489.
Fl. B. Ind. vi. 58. Wight, Ic. t. 1686 (poor).

Stem 6–8 in., as thick as a pigeon's quill to a crow's quill, curved; internodes ¼ in.; roots copious, long, slender; l. 2–3 by ⅛–⅙ in., narrowly linear, flat, recurved, tip unequally notched, thickly fleshy, channelled along the centre; racemes 1–1½ in., ped. very short and rhachis slender, simple; bracts minute; pedicel with ov. $\frac{1}{10}$ in.; fl. ¼ in. long; sep. ovate-oblong, obtuse, 1-veined; pet. shorter, orbicular-oblong, 1-veined; lip a large incurved laterally compressed spur, twice as long as the sep., rounded at the tip, side lobes 0, mid lobe a minute tooth; anth. depressed, cuspidate in front, pollinia 2, globose, purple, strap short, slender, gland large, oblong; fr. ¼–⅓ in., oblong or subpyriform, straight or curved, pedicel slender.

Forests of montane zone up to 6000 ft.; common. Fl. Sept.–Dec.; pale purple, the tip of the lip green.
Endemic.

6. **S. ochraceum,** *Lindl. in Bot. Reg.* xxviii. *Misc.* 2 (1842).
S. lineolatum, Thw. Enum. 304. C. P. 2741.
Cleisostoma maculosum, Benth. in Gen. Pl. iii. 581; Trim. Syst. Cat. Ceyl. 90 (non Lindl.).
Fl. B. Ind. vi. 62. Ann. Bot. Gard. Calcutt. viii. t. 291.

Stem 1–2 ft., stout, swollen upwards, internodes ½–1 in.; roots long, vermiform; l. distichous, 7–9 by 1–1½ in., lorate, straight or recurved, keeled, thickly coriaceous, rather deeply 2-lobed; panicle as long as the l. or longer, leaf-opposed, branches very short, rarely ½ in. long, spiciform, green, 2–5-fld.; bracts minute, brown; pedicel with ov. ¼ in.; fl. ¾ in. broad; sep. and pet. subequal, obovate-oblong, spreading, tips rounded; lip spurred, side lobes short, recurved, mid lobe broadly ovate, with a fleshy tooth on each side of the base, tip rounded, spur shorter than the sep., nearly straight, stout, obtuse; anth.

depressed, acute in front, pollinia 2, globose, yellow, strap filiform; fr. 1½–2 in., narrowly pyriform, erect, shortly stoutly pedicelled.

Moist region, 1000–3000 ft.; rather rare. Hunasgiriya; Hewaheta; Negombo. Fl. Sept., Oct., Dec.; sep. and pet. yellow, with fine red transverse striæ; lip white, with the spur pale yellow.

Malabar, E. Bengal, Burma.

First sent by Governor Sir Wilmot Horton to Loddiges' Nursery.

7. **S. acaule,** *Hk. f. Fl. B. Ind.* vi. 61 (1890).

Cleisostoma acaule, Lindl. Gen. and Sp. Orch. 227; Thw. Enum. 305. C. P. 3191.

Fl. B. Ind. vi. 61.

Stem very short, $\frac{1}{10}$–½ in., stout; roots up to 10 in. long, stout, flexuous; l. few, 2–4, distichous, ⅓–1½ in. long, linear-oblong, subfalcate, very unequally obtusely 2-lobed, one lobe oblong incurved up to ¼ in. long, the other small rounded; fl. 2–3, on a very short decurved green ped. 1–2 in. long, with short scarious sheaths; pedicel with ov. ¼ in.; fl. ⅓ in. diam., sep. and pet. linear-oblong, incurved, tip rounded; lip a broadly conical obtuse sac, shorter than the sep., side lobes short, mid lobe triangular, fimbriate; column broader than long, sides rounded; anth. depressed, ovate, truncate in front, pollinia 2, globose, strap very slender, gland large, 2-toothed; fr. ½–1 in., ellipsoid, obtuse at both ends, very shortly stoutly peduncled.

Lower montane zone 3–5000 ft.; rather rare. Hantane, frequent; Knuckles (Ferguson); Rangala. Fl. March, April; sep. and pet. pale green with red dots; lip white, the limb yellowish and red-dotted.

Endemic. (Description chiefly from a drawing in Herb. Peraden.)

8. **S. longifolium,** *Hk. f. in Fl. B. Ind.* vi. 62 (1890).

Acampe Wightiana, var. *β*, Thw. Enum. 303, var. *longepedunculata,* Trim. Syst. Cat. Ceyl. 90. C. P. 3492.

Fl. B. Ind. vi. 62. Lindl. Collect. Bot. t. 38 (*Vanda multiflora*). Ann. Bot. Gard. Calcutt. viii. t. 292.

Stem 2–3 ft., as thick as the middle finger, clothed except towards the top with sheaths; l. 6–12 by 1½ in., lorate, thickly coriaceous, shortly 2-lobed; panicle stoutly peduncled, 6–8 in. long, distantly branched, base with cupular sheaths, branches short, lower 1½–2 in.; bracts small, rounded; fl. ¾ in. broad, sep. broadly oblong, obtuse; pet. small, obovate-oblong; lip saccate, side lobes short, mid lobe ovate, obtuse, channelled in the middle, sac short, rounded, with a hairy vertical plate projecting in the hollow opposite the column.

Moist low country, 1–3000 ft.; rare. Ambagamuwa; Kitalgala. Fl. Sept., Oct.; entirely yellow, barred with red on both surfaces except the lip, which has a few red dots at apex.

Trop. Himalaya, Assam, Burma, China.

Lindley describes the spurs of *Vanda multiflora* as glabrous and inappendiculate within; but in all the specimens that I have examined (including Lindley's) there is a hairy plate within the sac descending from the mouth on the opposite side from the column (not dorsal, as stated in Fl. B. Ind.). A note of Dr. Trimen's says that the Ceylon plant in the Peradeniya Garden exactly resembles Lindley's figure, which was taken from a Chinese specimen that flowered in England.

9. **S. Wightianum,** *Hk. f. in Fl. B. Ind.* vi. 62 (1890).
Acampe Wightiana, Lindl. Fol. Orch. Acampe, 2; Thw. Enum. 303. C. P. 2342.
Fl. B. Ind. vi. 62. Wight, Ic. t. 1670 (*Vanda Wightiana*).

Stem 12–18 in., as thick as the little finger, covered with leaf sheaths except towards the top; internodes short; roots long, very stout; l. 4–6 by $1\frac{1}{4}$ in., ligulate, thickly coriaceous, flat, unequally 2-lobed, lobes rounded, sinus acute; panicle supra-axillary, 1–2 in., very stout, with many cupular sheaths at the base of the ped., simple or sparingly shortly branched; bracts very small, ovate persistent; pedicel with ov., $\frac{1}{8}$–$\frac{1}{4}$ in.; fl. $\frac{3}{4}$ in broad; sep. and pet. subequal, obovate-oblong, obtuse; lip small, rather shorter than the sep., side lobes small, obtuse, mid lobe ovate, obtuse, fleshy, sac short, rounded; anth. umbonate, pollinia 2, large, globose, strap short, very slender, gland small; fr. $1\frac{1}{2}$–3 in., subclavate or fusiform, subsessile.

Low country to 3000 ft.; rare. Jaffna (Gardner); Hantane. Fl. Sept.; sep. and pet. pale yellow, sparingly barred or spotted with red, lip white, with a few transverse red stripes.

Also in S.W. India. Possibly not distinct from *S. longifolium.*

S. congestum, Hk. f., is stated by Lindley (Bot. Reg. 1839, Misc. 61) to be from Ceylon, in Loddiges' collection. The cultivated specimen in his Herbarium is dated 1839. The figure in Wight, Ic. t. 1672 (*S. papillosum*), is referred to the same species in Fl. B. Ind.

S. viridiflorum, Lindl. There is a figure of this in Herb. Kew, with the locality 'near Kandy,' according to Fl. B. Ind. vi. 63. But Dr. Trimen did not consider its claim to be a native sufficient.

S. curvifolium, Lindl. Given from 'Ceylon (Macrae)' in Lindl. Gen. and Sp. Orch. 222. May probably have been in cultivation, but it is not known in a wild state in Ceylon.

33. SARCANTHUS, *Lindl.*

Characters of *Saccolabium*, but with the cavity of the spur of the lip vertically divided by a septum from base to about half way up or higher, but not reaching the mouth; a callus is present within the spur below the column, and another opposite to it.—Sp. about 40; 18 in *Fl. B. Ind.*

S. peninsularis, *Dalz. in Kew Journ. Bot.* iii. 247 (1857).
Saccolabium acuminatum, Thw. Enum. 304. C. P. 3376.
Fl. B. Ind. vi. 67. Wight, Ic. t. 1747 (*S. pauciflorus*, bad).

Stem 10–12 in., about as thick as a duck's quill, pendulous, flexuous, leafy, internodes ½–1 in.; l. 6–8 by ¼–⅓ in., ensiform, narrowed to the base and to the obtusely acuminate tip, strict or falcately recurved, keeled, 3–5-veined, sheaths ribbed; racemes 3–6 in., leaf-opposed, slender, peduncled, bracts minute; pedicel with ov. $\frac{1}{12}$ in.; fl. deflexed, sep. ovate-oblong, obtuse, rather spreading; pet. shorter, narrower, oblong-spathulate, lip as long as the sep., 3-lobed, side lobes very short, erect, subacute, mid lobe small, incurved, acute, spur as long as the mid lobe, subcylindric or conical, obtuse, septate to near the mouth or lower, dorsal callus 2-lobed; anth. with a long subulate beak, 2-celled; pollinia 4, sub-globose, strap very slender, gland small; fr. ⅔–¾ in., narrowly fusiform or oblong, deflexed.

Moist region below 1000 ft.; very rare. Near Ratnapura. Fl. Sept.; pale brownish-green, the lip white, with pink wings.
Also in S.W. India.

34. CLEISOSTOMA, *Bl.*

Characters of *Saccolabium*, but with a large dorsal callus in the spur below the column; differing from *Cleisostoma* in the spur not being septate.—Sp. about 30; 18 in *Fl. B. Ind.*

I have stated, in Fl. B. Ind. (vi. 61), that it would be better to unite *Cleisostoma* and *Sarcanthus* with *Saccolabium*. Here, in accordance with Dr. Trimen's views for this Flora, I follow the 'Genera Plantarum.' —J. D. H.

L. oblong or linear-oblong . . . . 1. C. MACULOSUM.
L. lorate.
Stem long, scandent . . . . 2. C. TENERUM.
Stem very short, stout . . . . 3. C. DECIPIENS.

1. **C. maculosum,** *Lindl. Gen. and Sp. Orch.* 227 (1833).
C. galeatum, Thw. Enum. 305 (non Benth.). C. P. 2343.
Fl. B. Ind. vi. 71.

Stem 12–18 in., as thick as a swan's quill; internodes ½–1 in.; roots very long, simple, articulate at intervals of 1–2 in.; l. 6–7 by ⅔–1¼ in., lorate, flat, coriaceous, obtusely unequally 2-lobed; ped. equalling the l. or shorter, stout, strict, simple or sparingly branched, sheaths distant, annular; fl. spicate at the end of the branches, about ⅓ in. broad; bracts short, broad; sep. and pet. similar, obovate-spathulate, obtuse, spreading; lip a subcylindric sac nearly as long as the sep., base rounded, side lobes truncate, mid lobe very small, ovate, retuse, papillose, dorsal scale truncate; anth. small, im-

perfectly 2-celled, beak truncate, pollinia 2, globose, strap linear, gland small, bifid; fr. $1\frac{1}{4}$–$1\frac{1}{2}$ in., sessile, fusiform, erect.

Moist region 1–3000 ft.; rather rare. Hantane; Avisawella. Fl. Jan.; orange-yellow, coarsely spotted with red.
Endemic.

2. **C. tenerum,** *Hk. f. in Fl. B. Ind.* vi. 73 (1890).
Æceoclades tenera, Lindl. Gen. and Sp. Orch. 236; Thw. Enum. 306. *Saccolabium tenerum*, Trim. Syst. Cat. Ceyl. 89. C. P. 2983.
Fl. B. Ind. vi. 73. Wight, Ic. t. 1680.

Stem 1–2 ft., as thick as a crow's quill, scandent, green speckled with red; internodes $\frac{1}{2}$ in.; roots long, slender, flexuous; l. 1–$1\frac{1}{2}$ in., oblong, or linear-oblong, spreading or recurved, tip notched; raceme or spike short, few-fld., on a short, stout, leaf-opposed ped. $\frac{1}{2}$–$\frac{3}{4}$ in. long, basal sheaths cupular; bracts cymbiform; pedicel with ov. $\frac{1}{6}$ in.; fl. $\frac{2}{3}$ in. across, sep. and pet. oblanceolate-oblong, obtuse, spreading, lateral sep. decurved; lip shorter than the lateral sep., side lobes erect, truncate, crenulate, mid lobe ovate, obtusely 3-lobulate, fleshy, spur very short, conical, incurved; anth. short, beak broad, obtuse, pollinia 2, globose, strap slender, gland small; fr. 1 in., oblong, fusiform or subpyriform, turgid, strongly ribbed, erect.

Forests of montane zone 3-6000 ft.; rather common. Fl. March, April; sep. and pet. yellow, with red longitudinal veins, lip white, with the wings pink or orange.
Also in the Nilgiri Mts., S. India.

3. **C. decipiens,** *Lindl. in Bot. Reg.* xxx. *Misc.* 11 (1844).
C. maculosum, Thw. Enum. 304 (non Lindl.). *C. Thwaitesianum*, Trim. in Journ. Bot. xxiii. 244. C. P. 3193.
Fl. B. Ind. vi. 75.

Stem very short, stout; roots copious, tortuous; l. 5–10 by $\frac{1}{2}$–1 in., lorate, flat., unequally obtusely 2-lobed, speckled beneath with purple, sheath very short, open; ped. slender, very short, bearing a simple or paniculately branched spike 5–6 in. long, lengthening to 7 in. in fr., branches flowering along their whole length; bracts minute, subulate; fl. $\frac{1}{6}$ in. broad, sep. oblong, subacute; pet. linear-oblong; lip a broad, subcylindric sac as long as the sep., rounded at the tip, side lobe truncate, mid lobe orbicular, dorsal callus broad erect; anth. orbicular, cuspidately beaked, pollinia 2, globose, strap linear, tip subulate, gland oblong; fr. $\frac{3}{4}$ in. long, sessile, linear-oblong, spreading.

Low country in moist region; rather rare. Heneratgoda; Hunasgiriya; Peradeniya, wild in the gardens. Fl. Jan.–March; sep. and pet. lemon-yellow, with crimson centres, lip paler, yellow or nearly white.
Endemic.

35. **MYSTACIDIUM,** *Lindl.*

Epiphytes, pseudobulb 0; l. few, distichous, linear, coriaceous; fl. small, in leaf-opposed racemes; sep. and pet. subequal, free, spreading; lip sessile on the base of the column, entire, spurred; column very short, foot 0; anth. hinged on the top of the column, persistent, 2-celled, pollinia 2, globose, waxy, attached by separate straps to two distinct glands.—Sp. about 20; 1 in *Fl. B. Ind.*

M. zeylanicum, *Trim. Syst. Cat. Ceyl.* 90 (1885).
Angræcum zeylanicam, Lindl. in Journ. Linn. Soc. iii. 40; Thw. Enum. 306. C. P. 3693 (part).
Fl. B. Ind. vi. 78.

Stem 3–4 in., stout, copiously rooting below; roots very long, simple and branched; l. 6–10 by $\frac{2}{3}$–$\frac{3}{4}$ in., linear or linear-oblong, straight, flat, rigid, many-veined, mid vein slender, very unequally 2-lobed, one lobe produced straight or incurved; ped. many, shorter than the l., slender, rigid; racemes 2–3 in., lax-fld., bracts minute, truncate, membranous, pedicel with ovary $\frac{1}{8}$ in.; fl. $\frac{1}{4}$–$\frac{1}{3}$ in. broad, green, sep. lanceolate, acuminate, 5-veined; pet. similar, but rather narrower, 3-veined; lip nearly as long as the sep., broadly ovate, cymbiform, finely acuminate, entire, spur as long as the sep., suberect, slender, subclavate; anth. firmly hinged on the very short column; fr. $\frac{2}{3}$ in., pedicelled, oblong or narrowly ellipsoid.

Moist region below 1000 ft. in forests; rather rare. Narawela, near Galle (Champion); near Ratnapura; between Matale and Kurunegala; Reigam Korale; Naluwa; Pelawatte near Hewesse. Fl. September; pale green.

Endemic.

C. P. 3693 partly consists of *Diploprora Championii.* I have seen no pollinia, and refer the plant to the African genus *Mystacidium* on Dr. Trimen's authority.—J. D. H.

36. **COTTONIA,*** *Wight.*

An epiphyte; stem stout, elongate, terete, leafy, emitting stout vermiform roots; internodes short; l. lorate, jointed on the sheaths, very coriaceous, keeled, tip unequally 2-lobed; ped. long, leaf-opposed, slender, simple or paniculately branched, flg. toward the ends of the branches; bracts small; sep. subequal, oblong, obtuse, and rather narrower petals spreading or reflexed; lip adnate to the base of the column, nearly twice as long as the sep., subpanduriform, base

* Dedicated to Major-General Frederick Cotton, C.S.I., of the Madras Engineers.

2-auricled, with interposed calli, side lobes indistinct, mid lobe rounded, retuse, margins villous, disk with a tooth-like callus; column very short, foot 0; anth. depressed hemispheric, with a truncate beak, 2-celled, pollinia 2, waxy, pyriform, 2-cleft, or 4, 2 smaller incumbent on the larger, strap long, gland small.—Sp. 2; both in *Fl. B. Ind.*

C. macrostachya, *Wight, Ic.* v. 1, 21 (1851).
Vanda peduncularis, Lindl. Gen. and Sp. Orch. 216. *C. peduncularis,* Thw. Enum. 303. C. P. 2361.
Fl. B. Ind. vi. 26. Wight, Ic. t. 1755. Bot. Mag. t. 7099 (from Ceylon plant).

Stem 4–8 in., nearly as thick as the little finger, woody, clothed with short appressed dark green leaf-sheaths; l. 5–8 by $\frac{1}{2}$–$\frac{2}{3}$ in., spreading, strict or recurved, abruptly ending in two lobes, one longer and more rounded than the other, with a broad acute sinus between them, keeled beneath, dull green, sometimes obscurely mottled; ped. 1–3 ft., stout, green, mottled with red, simple or branched, the branches forming terminal racemes; bracts very short, ovate, persistent, pedicel with ov. 1–1$\frac{1}{4}$ in.; sep. $\frac{1}{3}$ in. long; lip $\frac{1}{2}$ in. long; fr. 2$\frac{1}{2}$ in., narrowly fusiform, acutely angled.

Moist region to 3000 ft.; rather rare. Hantane; Peradeniya, wild in the gardens. Fl. March, April; sep. and pet. pale yellowish-green, veined with pink, lip dark purple, with a pale green central line and margins. The colouring of the Bot. Mag. plate does not represent the ordinary condition of the plant in Ceylon.
Also in S.W. India.
The only Ceylon epiphytic orchid with flowers which resemble an insect; these look like a large fly, beetle, or bee.

37. TÆNIOPHYLLUM, *Bl.*

Small stemless epiphytes, leafless (?) after flg., pseudobulbs 0; roots flattened; l. 2 or 3, linear, fleshy, veinless; ped. radical, filiform; fl. very minute, spicate; sep., pet., and lip connate in a 6-toothed perianth; lip cymbiform, margins free, fleshy, base produced into a saccate spur; column short, broad, foot 0; anth. quadrate, sub 4-celled, pollinia 4, in superposed pairs, pyriform, waxy, sessile on the gland.—Sp. 7; 3 in *Fl. B. Ind.*

T. Alwisii, *Lindl. in Journ. Linn. Soc.* iii. 42 (1859).
Thw. Enum. 305. C. P. 3195.
Fl. B. Ind. vi. 76. Rchb. f., Xen. Orchid. t. 116, f. 1.

A very minute epiphyte, apparently leafless after the first growth; roots green, fleshy, tortuous; l. 2–3, spreading and

lying flat on the bark of the tree on which the plant grows, an inch long or shorter, obtuse, green; ped. with the spike $\frac{1}{4}$–$\frac{1}{2}$ in., very slender, erect, few- or many-fld.; bracts minute, keeled; fl. about $\frac{1}{20}$ in. long, perianth shortly tubular, 6-fid., sep., pet., and lip acute, all of equal length, and all conformable, except the lip, which is cymbiform with free margins, and has a large sac or spur with a rounded tip as long as the rest of the perianth; column very short, with 2 stout projecting arms in front; anth. depressed, sub 4-celled, pollinia sessile on the broad gland; fr. sausage-shaped, $\frac{1}{3}$–$\frac{1}{2}$ in. long.

On branches of trees in moist region; apparently rare Hunasgiriya; abundant in Peradeniya Botanic Gardens; Hakgala Gardens. Fl. at any time of year; pale greenish-orange.

Endemic.

This very minute plant, barely half an inch in height, is no doubt constantly overlooked. It was discovered by the late H. de Alwis, draftsman to the Bot. Gardens, in January 1853.

The above character of *T. Alwisii* may want modification. It is founded chiefly on Thwaites's description drawn up from a single specimen and more recent drawings in the Peradeniya Herbarium, which represent what appears to be an early state of the plant, with linear green leaves, but these may be roots; the analyses accompanying the drawings are not quite satisfactory.—J. D. H.

38. DIPLOPRORA, *Hk. f.*

An epiphyte; stem short, stout, curved, leafy, with long vermiform roots from the bases of the short lower internodes, clothed with leaf sheaths; l. sessile, distichous, narrowly oblong, flat, flaccidly coriaceous, tip unequally 2-toothed; ped. leaf-opposed, stout, erect, few-fld.; fl. rather small, spicate, sep. spreading, dorsally winged, oblong, obtuse; pet. rather smaller, ovate or obovate-oblong, obtuse; lip rather longer than the lateral sep., adnate to the base of the column, narrowly cymbiform, abruptly contracted into an incurved long laterally compressed beak with a forked tip, disk with a fleshy keel; column very short, truncate, foot 0; anth. depressed hemispheric, beaked, 2-celled, pollinia 4, 2 hemispheric, each with a smaller adnate to its flat surface, strap short, gland small.—Monotypic.

D. Championii, *Hk. f. in Fl. B. Ind.* vi. 26 (1890).

Vanda bicaudata, Thw. Enum. 429. *Luisia bicaudata*, l. c. 302. *Cottonia Championii*, Lindl. Trim. Syst. Cat. Ceyl. 89. C. P. 3494, and C. P. 3693 (part).

Fl. B. Ind. vi. 26. Hook. Ic. Plant. t. 2120. Ann. Bot. Gard. Calcutt. viii. t. 274.

Stem 2–6 in. or more, sometimes leafy to the base, at others leafless below for several inches, and emitting numerous very long roots; l. jointed on the sheaths, 2–3 by $\frac{3}{4}$–1 in., thinly coriaceous, bright green, veinless; ped. with raceme 2–3 in., very stout, sometimes zigzag, green, bracts shorter than the ov., broadly ovate, obtuse, pedicel with ov. $\frac{1}{4}$ in., stout; sep. about $\frac{1}{3}$ in. long.

Moist low country below 2000 ft.; rare. Ambagamuwa Dist.; Karawita Kande, Sabaragamuwa, Balangoda. Fl. August; straw-coloured, with a few red markings on the lip.

Also in the Himalaya, Khasia, Burma, Hong Kong.

39. **PODOCHILUS,** *Bl.*

Stems tufted, leafy, rooting at the base only, pseudobulbs 0; l. short, distichous, closely imbricate, equitant, laterally strongly compressed, coriaceous, not jointed on the sheaths; fl. small or minute, in short terminal or subterminal spikes or racemes, resupinate; sep. and pet. conniving, dorsal sepal small, lateral much larger, adnate to the long decurved foot of the column, and forming with it a spur-like mentum; pet. broader and narrower than the dorsal sep.; lip jointed on the apex of the foot of the column, narrow, entire, membranous; column short, rostellum broad, erect, at length 2-fid.; anth. at the back of the column, erect, 2-celled, pollinia 4, pyriform, waxy, pendulous in pairs from a small gland at the tip of the rostellum, each pair enclosed in a calyptriform membrane that is removed with it.—Sp. 12 or more; 9 in *Fl. B. Ind.*

The above description does not include the species with flat or acicular non-equitant leaves, of which none have been found in Ceylon.

L. $\frac{1}{3}$–1 in. long.
  Pet. orbicular . . . . 1. P. FALCATUS.
  Pet. linear . . . . 2. P. MALABARICUS.
L. $\frac{1}{5}$–$\frac{1}{4}$ in. long . . . . 3. P. SAXATILIS.

1. **P. falcatus,** *Lindl. Gen. and Sp. Orch.* 234 (1833).
Thw. Enum. 306. C. P. 2527.
Fl. B. Ind. vi. 80.

Stems 6–15 in. long, slender, naked at the base, with stout spreading roots; l. $\frac{3}{4}$–1 in. by $\frac{1}{3}$ in. broad at the equitant base, ovate, obtuse, straight, erect, upper gradually smaller; racemes 1–3, very shortly peduncled, 1$\frac{1}{2}$–2 in. long, inclined or deflexed from the top of the stem, rhachis slender, fl. secund, about $\frac{1}{4}$ in. long from the tip of the dorsal sepal to

that of the mentum; bracts ovate, acuminate, membranous, deciduous; dorsal sep. oblong, obtuse, lateral broadly ovate, prolonged downward along the long decurved foot of the column into a spur-like saccate dependent mentum with a globose base; pet. nearly orbicular; lip jointed on to the globose base of the mentum, as long as the sep., narrowly obovate or spathulate, 5-veined, tip rounded, margins undulate; fr. $\frac{1}{4}$–$\frac{1}{3}$ in., oblong, terete, pedicelled.

Montane zone 3–6000 ft., on rocks; rather common. Fl. June–Sept.; pink, with the spur yellowish.

Endemic.

2. **P. malabaricus,** *Wight, Ic.* v. p. 20 (1852).
P. falcatus, var. *angustatus,* Thw. Enum. 306. C. P. 3889.
Fl. B. Ind. 80. Wight, Ic. t. 1748, f. 2.

Habit of *P. falcatus,* but more slender, with smaller shorter erect obtuse l. $\frac{1}{3}$–$\frac{1}{2}$ in. long; raceme 1–1$\frac{1}{2}$ in., inclined, lax-fld., rhachis capillary, ovate, bracts minute, acute; fl. about $\frac{1}{4}$ in. long, from the tip of the dorsal sep. to that of the mentum; dorsal sep. lanceolate, obtusely acuminate, lateral ovate-lanceolate, acuminate, prolonged downwards along the decurved foot of the column into a spur-like rather recurved dependent mentum with a rounded base; pet. linear, obtuse; lip very narrow.

Montane zone. Mattakelle, Galagedara. Fl. Oct., Jan.; white.

Also in S. India.

The specimens are insufficient to render the reference of the Ceylon plant to the Malabar one quite conclusive. In Wight's figure of the latter (of which I have seen no flowers) the sep. and pet. are represented as more oblong than in the Ceylon specimens. There is a figure of the latter in Herb. Perad.; but, though showing a very different plant from *P. falcatus,* it is not satisfactory as to the structure of the flowers.—J. D. H.

2. **P. saxatilis,** *Lindl. Gen. and Sp. Orch.* 235 (1833).
Thw. Enum. 307. C. P. 3194.
Fl. B. Ind. vi. 81.

Stem 2–3 in.; l. $\frac{1}{5}$–$\frac{1}{4}$ in., equitant, suberect or recurved, broadly ovate, tip rounded; raceme $\frac{1}{2}$–1 in., terminal, filiform inclined, 6–8 fld.; fl. $\frac{1}{15}$ in. long, secund; bracts minute, ovate; dorsal sep. broadly ovate, obtuse, lateral broader, obtuse, prolonged downwards along the decurved foot of the column into a saccate rather recurved spur-like mentum with a rounded base; pet. obovate-oblong, obtuse; lip spathulate; fr. $\frac{1}{10}$ in. diam., globose or ellipsoid.

Moist and intermediate regions to 3000 ft., creeping over rocks and tree-trunks; rather rare. Ambagamuwa; Hantane; Dolawa Kande, abundant. Fl. December; 'yellow, lip red in the middle' (Ic. in Herb. Lindl.).

Endemic.

40. **PHREATIA,** *Lindl.*

Epiphytes of various habits, pseudobulbous or not; l. distichous, narrow, jointed on the equitant sheaths, coriaceous or fleshy; ped. terminal; fl. minute, in spiciform racemes, secund, and bracts of soft cellular tissue; sep. connivent, subequal, oblong or triangular, lateral adnate to the foot of the column, bases saccate, forming a mentum; pet. shorter than the sep., oblong; tip inserted in the foot of the column, very small, clawed; column short, broad, base produced into a foot; anth. terminal, 2-celled, pollinia 8, microscopic, globosely pyriform, waxy, united by a narrow caudicle to a gland on the rostellum. —Sp. about 10; 4 or 5 in *Fl. B. Ind.*

The genus *Phreatia* is, owing to the minuteness and soft texture of the flowers, very difficult of examination from dried specimens, and the above description does not embrace various Indian and Malayan species. Its close affinity with *Octarrhena* and *Thelasis*, as shown in habit, in the cellular tissue of the flowers, and in the dorsal position of the anth. on the column, seems to prove its belonging to the tribe *Vandeæ* and subtribe *Notylidæ*.—J. D. H.

1. **P. elegans,** *Lindl. Gen. and Sp. Orch.* 63 (1830).
Thw. Enum. 299. *Thelasis elegans*, Bl. Mus. Bot. ii. 187. C. P. 3186. Fl. B. Ind. v. 810. Ann. Bot. Gard. Calcutt. viii. t. 333.

Stems densely tufted, very short, sub-pseudobulbous, roots of stout fascicled fibres; l. 2–4 in., sessile on their thin sheaths, linear, narrowed at the base, obtuse, coriaceous, 1-veined; ped. longer than the l., erect, with the spiciform many-fld. raceme 2–3 in. long; fl. very shortly pedicelled, subsecund; bracts ovate-oblong, acuminate, 1-veined, closely sheathing the curved ov.; sep. $\frac{1}{20}$–$\frac{1}{12}$ in. long, 1-veined, broadly triangular, acute, dorsal rather the smaller, lateral gibbous at the saccate base; mentum rounded; pet. $\frac{1}{3}$ shorter than the lateral sep., oval, obtuse; lip very small, nearly orbicular, with a sigmoid claw, disk faintly veined, column truncate in front, with a minute rostellum; anth. obtusely conical, transversely oblong after dehiscence; pollinia most minute, cohering by a viscus.

Very rare. Peradeniya (Macrae). No one else has collected it in Ceylon. Fl. white.

Also in the Khasia Hills.

The single specimen in Herb. Perad. has no locality; and there is no drawing.

41. **OCTARRHENA,** *Thw.*

A small epiphytic tufted leafy herb; roots fibrous; l. distichous, laterally compressed, jointed on their equitant sheaths, coriaceous; ped. axillary; fl. minute, secund in spiciform

racemes, and bracts of soft cellular tissue; sep. subequal, orbicular-ovate, obtuse; pet. half as long as the sep., ovate-oblong, obtuse; lip sessile at the base of the column, ovate-oblong, concave, fleshy, entire; column very short, broadly triangular, with a deep stigmatic pit at the base, foot 0; anth. dorsal, erect, 2-celled, pollinia 8, microscopic, globosely pyriform, waxy, pendulous by a linear caudicle from a gland attached to the minute rostellum at the top of the column.

This genus was referred by Bentham to *Phreatia*, and is retained in that genus in Fl. Brit. Ind. A re-examination of the flowers, and comparison with an excellent drawing in Herb. Perad., inclines me to retain the genus as proposed by Thwaites, who correctly refers it to *Vandeæ*. I do not find the caudicle of the pollinia to be forked as represented in the Peradeniya drawing.

O. parvula, *Thw. Enum.* 305. C. P. 3072.
Phreatia parvula, Benth. ex Hook. f. Fl. Brit. Ind. v. 381.

Stem 3–5 in., stout, curved, at length naked below; l. $\frac{1}{2}$–$\frac{3}{4}$ in., linear-oblong, acute, fleshy, ped. with spiciform raceme 1 in., rhachis stout, usually curved, pedicels very short; bracts broadly ovate, acuminate, sheathing the short nearly straight ov.; sep. about $\frac{1}{10}$ in. long.

Montane zone, 4–7000 ft.; rather common. Hantane; near Matale; Rangala; Maturata; Dimbula; Hakgala; Horton Plains. Fl. Aug.–Jan.; pale green.

Endemic.

Dr. Trimen observes that this plant has much the habit of an *Oberonia*, and that it can scarcely come under *Phreatia*. It is very closely allied to, if not the same with, *Phreatia nana*, Fl. B. Ind. v. 811. (Hook. Ic. Pl. t. 2084), from Perak.—J. D. H.

42. CRYPTOSTYLIS, *Br.*

Terrestrial herbs, rootstock short, stout, bearing long petioled membranous leaves, and leafless flg. scapes; roots of strong fibres; fl. loosely racemed, sep. subequal, narrowly linear, subacute, spreading; pet. as narrow, shorter, spreading; lip superior, large, erect, inserted at the base of the column, oblong or lanceolate, entire, base contracted embracing the column; column very small, short, foot 0, rostellum broad, thick, acute, notched after detachment of the pollinia; stigma anticous, tumid; anth. dorsal, short, broad, 2-celled, pollinia 2, pyriform, granular, sessile on the small gland, pendulous from the rostellum.—Sp. 7; 1 in *Fl. B. Ind.*

C. Arachnites, *Bl. Orch. Arch. Ind.* 132 (1858).
Zosterostylis zeylanica, Lindl. Gen. and Sp. Orch. 446; Thw. Enum. 312. *Z. Walkeræ*, Wight, Ic. v. 1, 20. C. P. 383.
Fl. B. Ind. vi. 118. Bot. Mag. t. 5381. Wight, Ic. t. 1748, f. 4.

Quite glabrous; rootstock thick, with long, stout, tomentose root-fibres; l. 1–3, erect, 3–6 in., oval or oval-lanceolate, acute at both ends, bright green, membranous, with 3 principal veins and many intermediate connected by transverse venules; petiole about as long as the blade, slender, red-brown, surrounded at the base by membranous sheaths; scape 8–18 in., slender, red-brown, with short acute imbricating basal sheaths, and a few much longer above; raceme 4–8 in., laxly many-fld.; fl. suberect, bracts convolute, as long as and embracing the ov., which, with the very short ped., is decurved, nearly 1 in. long; sep. and pet. exactly linear, subacute; lip superior, erect, as long as the sep. or longer, oval, apiculate, very flat, with recurved margins, disk without calli or crests, base cordate, embracing the minute column.

Moist region, 1-4000 ft., in shady forests; rather common. Fl. March, September, October; sep. and pet. green, lip reddish-pink, spotted with darker red.

Khasia, Malay Peninsula, Java.

The column is so small that it is not at once apparent that the anther is dorsal as in *Spiranthes*, &c.—J. D. H.

43. HETÆRIA, *Bl.*

Characters of *Goodyera* (p. 213), but lip superior, margins adnate to the sides of the column, and stigmatic tubercles 2, lateral.—Sp. about 15; 7 in *Fl. B. Ind.*

Spike, 4–10 in. . . . . 1. H. GARDNERI.
Spike, 3–5 in. . . . . 2. H. ELONGATA.

1. **H. Gardneri,** *Benth. in Gen. Pl.* iii. 604 (1883).
Rhamphidia Gardneri, Thw. Enum. 313. C. P. 3425.
Fl. B. Ind. vi. 115.

Tall, stout, 12–20 in. high; stem leafy below, as thick as a swan's quill, green; l. few, rather distant, 2–4 by $1\frac{1}{2}$–$3\frac{1}{2}$ in., petioled, ovate, subacute, often oblique, 3-veined, membranous, glabrous; petiole short, dilating into the short large ventricose hyaline sheath; ped. with 2 or 3 rather large acute sheaths, puberulous; spike 4–10 in., laxly many-fld., glandular-pubescent; fl. subsecund, bracts $\frac{1}{4}$ in., as long as the ov. or shorter; dorsal sep. glandular-pubescent, ovate, 1-veined; lateral $\frac{1}{8}$ in. long, oblong, obtuse, 3-veined; pet. inserted on the sides of the column, narrowly spathulate, 1-veined: lip as long as the sep., superior, cymbiform, membranous, with a few calli on the veins within; column very short, rostellar arms

short, stigmatic lobes large; anth. short, pollinia 2, broadly pyriform or subglobose, each attached by a short strap to an oblong gland.

Moist region to 4000 ft.; rare. Morowak Korale; Peradeniya, abundant in shady places, doubtfully wild there. Fl. Jan.; sep. and pet. greenish-brown, lip yellow.

Endemic.

2. **H. elongata,** *Lindl. in Wall. Cat.* n. 7384 (1828).
Rhamphidia elongata, Thw. Enum. 313. C. P. 2739.
Fl. B. Ind. vi. 116, 197. Hook. Ic. Pl. t. 2190.

Tall, slender, 1½–2½ in. high; stem leafy in the lower half, as thick as a goose-quill below; l. 2–4 in., petioled, obliquely oval or oblong-lanceolate, acuminate, subacute, or lower obtuse, membranous, veins 5, very slender, parallel, with many cross-venules; petiole ½–¾ in., sheath hyaline, inflated; ped. slender, pubescent, with a few distant lanceolate sheaths; spike 3–5 in., lax-fld., rhachis slender, and fl. laxly glandular-tomentose; bracts ¼ in., lanceolate, shorter than the erect ov.; sep. ⅙ in. long, oblong, obtuse, pubescent; pet. inserted on the sides of the column, subfalcately oblong-obovate, tip rounded; lip superior, as long as the sep., cymbiform, with 2 short, lateral lobes at the base, acute, membranous, 5-veined, veins with a few soft spines towards the base; column very short, rostellar arms subulate; anth. ovate-cordate, tip elongate, flexuous, pollinia subglobose, each attached by a slender caudicle to a small oblong gland.

Montane zone, 3-4000 ft.; rare. Hunasgiriya; Hewahetta; Ambagamuwa. Fl. Nov.–Jan.; pink.

Also in Malay Peninsula (?).

Finlayson's specimen is supposed to be Malayan; but, as he also collected in Ceylon, it is probable that it is from here.

44. CHEIROSTYLIS, *Bl.*

Small terrestrial herbs, with simple stems and fibrous roots at the lower nodes; l. few, ovate, membranous; fl. small, in terminal racemes; sep. 3, connate to the middle in a gibbous tube; pet. narrow; lip inserted at the base of the column, erect, narrow, shortly clawed, base of claw saccate, limb dilated, crenate or toothed; column short, with 2 elongate, flat appendages in front, rostellum at length 2-cleft; stigmatic lobes lateral; anth. erect, 2-celled, pollinia 2, bipartite, granular, on a short strap, gland narrow.—Sp. about 12; 6 in *Fl. B. Ind.*

Raceme elongate, puberulous . . . . . . 1. C. PARVIFOLIA.
Raceme short, glandular-pubescent . . . . 2. C. FLABELLATA

1. **C. parvifolia,** *Lindl. in Bot. Reg.* xxv. Misc. 19 (1839).
Lindl. Gen. and Sp. Orch. 488; in Journ. Linn. Soc. i. 187. Thw. Enum. 313. C. P. 3071.
Fl. B. Ind. vi. 105.

Whole plant 3–6 in. high, slender; stem prostrate below with short, tumid, green internodes, the upper internodes enclosed in hyaline sheaths; l. 3–6, rather distant, $\frac{1}{2}$–1 in. long, ovate or ovate-lanceolate, acuminate, dark greenish-brown above, glabrous, veins obscure; petiole $\frac{1}{4}$ in., sheath hyaline, inflated; raceme elongate, puberulous, bracts about as long as the pedicels; fl. minute, sep. $\frac{1}{12}$ in., glabrous, connate to the middle, dorsal broadest, ovate, obtuse; pet. oblong-obovate, obtuse, tips exserted; lip rather longer than the sep., base of claw subsaccate, enclosing 2 small forked calli, limb exserted, subquadrate, 6–8-lobed; column with 2 parallel appendages in front; rostellum at length bifid, arms subulate; anth. dorsal, ovate-cordate, pollinia pyriform, sessile on a short narrow gland.

Moist region, 2–4000 ft.; rare. Ambagamuwa; Hantane. Fl. Jan., Feb.; pinkish-white.
Endemic.

2. **C. flabellata,** *Wight, Ic.* v. 1, 16 (1851).
Thw. Enum. 313. C. P. 3377.
Fl. B. Ind. vi. 105. Wight, Ic. t. 1727 (*Monochilus flabellatus*).

Whole plant 6 in. high; stem stout, prostrate below with tumid internodes; l. few, $\frac{1}{3}$–$\frac{2}{3}$ in., petioled, ovate, acute, 3-veined, glabrous, sheaths hyaline, truncate, inflated; ped. very slender, flexuous, and bracts and tubular parts of perianth glandular-pubescent, sheaths few, loose, narrowly lanceolate; raceme short, few- and lax-fld., bracts lanceolate, longer than the very short pedicels; cal. about $\frac{1}{5}$ in. long, tube ventricose, lobes ovate-oblong, obtuse; pet. linear-oblong, falcate, obtuse, tips exserted; lip with a very short saccate claw, and a broad spreading suborbicular 2-lobed limb, lobes sub 5-fid, sac cymbiform, with 2 enclosed calli; appendages of column and rostellar arms long, subspathulate; anth. with a dilated membranous tip, pollinia 2, pyriform, subsessile on the elongate gland.

Montane zone, 3–6000 ft.; rare. Ambagamuwa; Nuwara Eliya. Fl. Feb., March.
Hills of S. India, Bhotan, and Burma.

45. PHYSURUS, *Rich.*

Terrestrial herbs; stem stout and creeping below; roots fibrous; l. petioled, ovate, acute; fl. in a small terminal spike;

sep. distinct, dorsal forming a hood with the pet., lateral oblong, spreading; pet. obovate or oblong; lip small, inserted on the base of the column, as long as the lateral sep., entire, base spurred, spur protruded beyond the bases of the sep., disk naked; column very short, not appendaged in front, rostellum at length bifid; stigma anticous, tumid; anth. dorsal, ovate, long-acuminate, erect, 2-celled, pollinia 2, clavate, granular, bipartite, attached to the rostellum by a small gland.—Sp. about 20; 2 in *Fl. B. Ind.*

P. Blumei, *Lindl. in Wall. Cat.* n. 7397 (1828).
Lindl. Gen. and Sp. Orch. 504; in Journ. Linn. Soc. i. 181; Thw. Enum. 314. C. P. 598.
Fl. B. Ind. vi. 94. Bl. Orchid. Archip. Ind. t. 27, f. 2.

Stem 1–2 ft., as thick as a crow's quill, ascending from a creeping sometimes branched rooting base, glabrous below; l. scattered, 2½–3 in. long, ovate or ovate-cordate, acute, 3–5-veined; petiole very short, sheath ½ in., hyaline, inflated; ped. tall, slender, pubescent; sheaths an in. long, finely acuminate; spike 2–5 in., glandular-pubescent or villous, laxly many-fld.; bracts ⅓ in., equalling the curved glandular-pubescent ov.; sep. ⅙ in., pubescent 1-veined; pet. obovate-oblong; lip saccate, with a retuse glabrous flabelliform limb, sac much shorter than the ov., and 2-lobed.

Moist region, 1–3000 ft.; rather rare. Hantane; Peradeniya. Fl. Jan.–March; orange-pink, the limb of the lip white.
Also in Sylhet and Java.

46. ANÆCTOCHILUS, *Bl.*

Terrestrial leafy herbs; stem creeping below; roots fibrous; l. petioled, membranous, ovate; fl. small, in a glandular-pubescent terminal spike; sep. free, dorsal forming a hood with the pet., lateral spreading; pet. falcate; lip attached to the base of the column, longer than the lat. sep., clawed, terminal lobe 2-winged, claw fimbriate, spurred at the base, spur protruded beyond the base of the lateral sep., cavity with 2 calli; column short, with 2 parallel lamellæ in front, rostellum short, at length 2-fid. or 2-toothed, stigmatic lobes lateral; anth. dorsal on the column, 2-celled, pollinia 2, clavate or pyriform, lamellate, narrowed into a single caudicle, which is attached by a gland to the rostellum.—Sp. about 10; 7 in *Fl. B. Ind.*

A. regalis, *Bl. Orch. Archip. Ind.* 46 (1858). **Wana-raja,** *S.*
A. setaceus, Lindl. Gen. and Sp. Orch. 499; Thw. Enum. 314 (non Bl.). C. P. 384.
Fl. B. Ind. vi. 95. Wight, Ic. t. 1731. Bot. Reg. t. 2010. Bot. Mag. t. 5208.

Whole plant 6–10 in. high; stem erect from a long creeping tortuous base, as thick as a small goose-quill; l. 3–5, spreading, 1–1½ in. long, sessile or shortly petioled, ovate or ovate-cordate, subacute or acuminate, glabrous, dark velvety green above with orange reticulations, or almost black-purple with red reticulations, pale beneath, sheath hyaline, inflated; ped. stout or slender, with 2–3 distant lanceolate coloured sheaths, glandular-pubescent; bracts lanceolate, shorter than the ov.; sep. ⅓ in. long, ovate, subacute; pet. broadly falcate; lip longer than the sep., margins of claw crinite with long flexuous cilia, wings quadrate, much shorter than the claw; spur shorter than the ov., inflated, tip contracted, notched.

Moist region, 1–4000 ft., among leaves in forests; rather common. Fl. May–Sept., Jan.; sep. and pet. greenish-pink, lip white.

Endemic.

The plant varies a good deal in colouring; the leaves, in the most ornamental form, are dark greenish-purple, with the network of veins orange, but sometimes they are pure deep green with golden veining, and at other times, as in the Bot. Mag. fig. above quoted (var. *inornatus*, Hook.), the veining is not differently coloured to the rest of the leaf.

Doubtfully distinct from the *A. setaceus* of Java. Linnæus's name, *Satyrium repens*, inadvertently given as a synonym in Fl. B. Ind., belongs to the N. European *Goodyera repens*.—*Trimen.*

47. GOODYERA, *Br.*

Terrestrial leafy herbs; stem erect, from a creeping base; l. few or many, ovate or lanceolate, petioled; fl. small, in often twisted spikes; sep. subequal, dorsal erect, forming a hood with the narrow pet., lateral conniving or spreading, covering the sac of the lip by their bases; lip erect, sessile on the base of the column, entire, cymbiform or saccate, sac not produced beyond the base of the lateral sep., naked or setose within, limb 0, or very small; column short or long, without frontal appendages, top cupular, rostellum erect, entire, or 2-fid; stigma broad, anticous; anth. dorsal, operculate, beaked, pollinia 2, pyriform or clavate, granular, with or without a strap, gland small.—Sp. about 40; 15 in *Fl. B. Ind.*

Lip with a short recurved tip . . . . . . 1. G. PROCERA.
Lip with a long revolute tail . . . . . . 2. G. FUMATA.

1. **G. procera,** *Hook. Exot. Fl.* i. t. 39 (1823).
Lindl. Gen. and Sp. Orch. 493. Thw. Enum. 313. C. P. 597.
Fl. B. Ind. vi. 111. Wight, Ic. t. 1729. Bot. Reg. t. 639 (*Neottia procera*). Ann. Bot. Gard. Calcutt. viii. t. 378.

Stem tall, stout, 2–3 ft. high, from a prostrate rooting base as thick as the little finger, leafy; roots long, vermiform; l. 4–8 by 1–2 in., petioled, oval or oval-lanceolate, acuminate, pennivcined from a stout midrib, veins very obliquely ascending; petiole 2–3 in., very stout, dilated into a broad open sheath; ped. stout or slender, strict or flexuous, sheaths many, large, lanceolate, acuminate, lower foliaceous; spike 3–6 in., cylindric, dense-fld., rhachis glabrous or pubescent, bracts lanceolate, as long as the ov.; fl. small; sep. spreading and recurved, $\frac{1}{10}$ in. long, dorsal oblong, lateral broadly ovate, obtuse; pet. spathulate; lip as long as the sep., cymbiform, setose within, and with two large calli towards the recurved tip; column very short, rostellum bifid; anth. broadly ovate, pollinia broadly pyriform, sessile on the oblong gland.

Moist region in damp places to 4000 ft.; common. Fl. Jan., June; orange-cream coloured, fragrant.
S. India, Trop. Himalaya, Burma, China, Java.

2. **G. fumata,** *Thw. Enum.* 314 (1861).
C. P. 3668.
Fl. B. Ind. vi. 111. Ann. Bot. Gard. Calcutt. viii. t. 377.

Stem 3 ft. high, stout, leafy; l. 6–10 by 3–4 in., obliquely oval-lanceolate, veins many, obliquely ascending, most of them from towards the base of the midrib, petiole 2–4 in., stout, sheaths broad, inflated; ped. stout, and spike glandular-pubescent, sheaths large, lower leafy, bracts as long as the fl. or shorter, lower larger, foliaceous; spike a foot long, stout, lax-fld., bracts longer than the ov., $\frac{1}{3}$ in., ovate-lanceolate, acuminate, membranous; sep. $\frac{1}{4}$–$\frac{1}{3}$ in. long, dorsal ovate-lanceolate, lateral ovate, acute, 3-veined; pet. dimidiate-lanceolate, acuminate, falcate; lip short, rhomboidly orbicular, concave, as broad as long, strongly many-veined, abruptly contracted into a revolute ligulate, acuminate tail, glandular within; column long, slender, arched, tip dilated, funnel-shaped, rostellum elongate, erect, entire or 2-toothed; anth. broadly ovate, acute, pollinia clavate, sessile on a small oblong gland.

Central Province; rare (Thwaites). The C. P. specimens, all I have seen, are localised 'Ambagamuwa,' with a ?. Fl. December; sep. and pet. pinkish-green, lip pale yellow.
Also in the Sikkim Himalaya.
The column is incorrectly described in Fl. B. Ind.

48. **ZEUXINE,** *Lindl.*

Terrestrial, leafy herbs; stem creeping below; l. sessile or petioled, narrow or broad, membranous; fl. in a terminal spike, small; sep. subequal, dorsal cohering with the pet. in a hood, lateral free, connivent or spreading; pet. narrower; lip sessile or shortly clawed, cymbiform or saccate, with a small entire or wing-like terminal lobe, sac not produced beyond the base of the lateral sep., with two calli or spurs at the base within; column very short, 2-keeled or winged in front, rostellum short, stigmatic lobes 2, marginal; anth. dorsal on the column, 2-celled, membranous, pollinia 2, pyriform, attached by a gland to the rostellum with or without a (sometimes appendaged) caudicle.—Sp. about 20; 11 in *Fl. B. Ind.*

L. all cauline, sessile, erect, narrow . . . . 1. Z. SULCATA.
L. towards the base of the stem, ovate or oblong.
  Wings of lip toothed . . . . 2. Z. LONGILABRIS.
  Wings of lip entire.
    L. oval-lanceolate . . . . 3. Z. REGIA.
    L. broadly ovate . . . . 4. Z. FLAVA.

1. **Z. sulcata,** *Lindl. Gen. and Sp. Orch.* 485 (1840).

Fl. Zeyl. n. 319. *Orchis strateumatica*, L. Sp. Pl. 943. Lindl. in Journ. Linn. Soc. i. 186. Thw. Enum. 312. C. P. 3017.

Fl. B. Ind. vi. 106. Wight, Ic. tt. 1724 bis (*Z. bracteata*), 1725 (*Z. brevifolia*), and 1726 (*Z. robusta*). Ann. Bot. Gard. Calcutt. viii. t. 381.

Whole plant 2–10 in. high, leafy throughout, glabrous; roots fibrous; l. erect, lower 1–2 in., sessile, linear-lanceolate, acuminate, upper gradually smaller, margins usually recurved, midrib stout; spike $\frac{1}{2}$–2 in., strict, dense-fld., bracts $\frac{1}{4}$–$\frac{1}{2}$ in., about as long as the fl. or longer, erect, lanceolate, acuminate, hyaline; sep. about $\frac{1}{6}$ in. long, oblong, obtuse, membranous; pet. oblong, obtuse; lip about as long as the lateral sep., cymbiform, contracted into a short pubescent claw, terminated by a very small hammer-headed simple or 2-lobed limb; column very short, top 2-winged; anth. short, ovate, covered by the wings of the column, pollinia pyriform, attached to the face below the tip of a linear gland; fr. $\frac{1}{4}$ in. long, ellipsoid.

Low country; rather rare. Kukul Korale; Dolosbagie; Nilgala, Uva Pasdun Korale. Fl. Dec., Jan.; sep. and pet. greenish-white, lip yellow

Throughout India, China, Burma, Java, Philippine Is.

R. Br. (Prod. Fl. Nov. Holl. 319) remarks that Hermann's specimens of *Orchis strateumatica, L.*, are a *Neottia* as he understood that genus; hence Lindl. (Gen. and Sp. Orch. 465) referred the name to *Spiranthes australis* as being the only species of that genus from Ceylon.

2. **Z. longilabris,** *Benth. in Gen. Pl.* iii. 600 (1883).
Monochilus longilabre, Lindl. Gen. and Sp. Orch. 487; Journ. Linn. Soc. i. 186; Thw. Enum. 313. C. P. 2377.
Fl. B. Ind. vi. 107. Wight, Ic. t. 1728 (*M. affinis*).

Whole plant 6-10 in. high, very slender, ascending from a creeping rooting base about as thick as a crow's quill; l. few, rather distant, shortly petioled, 1–1½ in. long, ovate or ovate-oblong, acute, base rounded, 7 veined, glabrous, sheath short, hyaline, inflated; ped. very slender, pubescent, with 2 distant narrowly lanceolate sheaths; spike 2–3 in., lax-fld., glandular-pubescent; bracts about as long as the ov., narrowly lanceolate; sep. ¼ in. long, oblong, obtuse, pubescent; pet. oblong, obtuse, glabrous, lip twice as long as the sep., claw saccate at the base, gradually dilated into the deeply 2-lobed obovate-cuneate mid lobe, the cuneate wings or lobes of which are separated by a narrow acute sinus, and are crenulate or coarsely toothed on the outer margin, sac with 2 spurs in the cavity; anth. long-beaked, pollinia pyriform, adnate for two-thirds of their length to a linear strap, gland small.

Low country to 3000 ft. in intermediate region; rare. Maturata Dist.; Lagalla. Fl. May, September; sep. greenish, pet. and lip white.
S.W. India, E. Bengal, Burma.

3. **Z. regia,** *Benth. in Gen. Pl.* iii. 600 (1883). **Iru-raja,** *S.*
Monochilus regium, Lindl. Gen. and Sp. Orch. 487; Thw. Enum. 313. C. P. 2643.
Fl. B. Ind. vi. 108. Hook. Ic. Plant. t. 2174.

Whole plant 4–6 in. high, slender, lower internodes elongate, rooting; l. few, 1½–2½ in., rather distant, shortly petioled, oval- or oblong-lanceolate, acute, green, with a median pale band above, sheath short, tubular, truncate, membranous; ped. very slender, short, few-fld., sheaths distant, narrowly lanceolate; spike pubescent, bracts lanceolate, equalling or shorter than the pubescent ov.; sep. ⅓ in. long, glabrous, dorsal oblong, hooded, lateral spreading, ovate-oblong, obtuse; pet. linear-oblong, falcate, tip rounded; lip rather longer than the lateral sep., claw naked, its cymbiform base enclosing 2 uncinate calli, wings divaricate, subquadrate, outer margin sinuate or crenate; rostellum deeply 2-fid, arms long; anth. broad, obtusely beaked, pollinia 2, obovoid, sessile on the end of a linear strap, with incurved margins, gland small, ovoid.

Moist region 1–4000 ft. in damp forests; rather common. Hantane; Ambagamuwa. Fl. Dec.; greenish-white.
Endemic.
Cultivated for its foliage (like *Anœctochilus*, &c.)

Z. nervosa, Lindl. is given for Ceylon in Journ. Linn. Soc. i. 187, on authority of a specimen so labelled in Herb. Hk. at Kew. The locality is an error (see Fl. B. Ind. vi. 108).

4. **Z. flava,** *Benth. in Gen. Pl.* iii. 600 (1883).
Monochilus flavum, Lindl. in Journ. Linn. Soc. i. 187; Thw. Enum. 313. Trim. Syst. Cat. 90. C. P. 3120.
Fl. B. Ind. vi. 108. Hook. Ic. Pl. t. 2176. Ann. Bot. Gard. Calcutt. viii. t. 386.

Whole plant 10–24 in. high; stem stout, inclined or prostrate below, with long rooting internodes and roots clothed with matted fibrils; l. 4–7, distant, 1–2 in. long, sessile or shortly stoutly petioled, ovate, acute, or obtuse, 5-veined, bright green, membranous, sheath obliquely truncate, rather inflated, hyaline; ped. and spike sparsely hairy, purplish, with few distant small lanceolate sheaths; spike 3–5 in., slender, laxly many-fld.; bracts lanceolate, as long as the ov.; sep. $\frac{1}{12}$ in. long, hairy externally, dorsal hooded, lateral ovate, obtuse, spreading; pet. dimidiate-oblong, obtuse; lip rather longer than the lateral sep., sessile, base saccate enclosing 2 twisted spurs, claw naked, suddenly dilated into two divaricate, oblong-quadrate wings, outer margins of wings entire or toothed; rostellum at length 2-partite, segm. erect; anth. ovate-lanceolate, pollinia obovoid, sessile or shortly stipitate on an oblong gland.

Moist region 1–3000 ft. in damp forests; rare. Dolosbagie; Ambagamuwa. Fl. Feb., March; white, sac of the lip pink, limb tinged with yellow.

Himalaya, Assam, Burma, Java, Borneo.

49. SPIRANTHES, *Rich.*

Small, terrestrial, leafy herbs; roots of fleshy, cylindric or tuberous fibres; l. narrow, bases sheathing or petioled; fl. small, secund in a twisted erect spike; sep. subequal, dorsal arched, forming a hood with the pet., below spreading from an erect gibbous base; pet. linear; lip as long as the lateral sep., erect, obovate or fan-shaped, recurved, base concave or saccate, sac not produced beyond the bases of the lateral sep.; column short, terete, rostellum short, stigma broad, anticous; anth. dorsal, erect, 2-celled, pollinia 4, united in pairs, clavate, granular, pendulous from the rostellum by a small gland.—Sp. 80; 2 in. *Fl. B. Ind.*

S. australis, *Lindl. in Bot. Reg.* x., *sub* t. 823 (1824).
Lindl. Gen. and Sp. Orch. 464; Journ. Linn. Soc. i. 178. Thw. Enum. 312. C. P. 550.
Fl. B. Ind. vi. 102. Wight, Ic. t. 1724. Ann. Bot. Gard. Calcutt. viii. t. 369.

Roots of elongate, fleshy, white, cylindric or almost tuberous fibres; stem 6–18 in., rather stout or slender, distantly leafy; lower l. 1–5 in., linear oblong or oblanceolate, obtuse, narrowed into a long or short petiole, upper subulate; spike 3–6 in., slender, dense-fld., twisted, glandular-pubescent; bracts ovate, acute or acuminate, exceeding the short suberect ov.; fl. $\frac{1}{10}$–$\frac{1}{6}$ in. long, glabrous; sep. linear-oblong, tips obtuse, recurved; pet. narrower; lip oblong or sub-flabelliform, truncate, crenate-toothed, margins undulate, tip retuse or apiculate, base saccate, 2-glandular within, disk pubescent; fr. $\frac{1}{4}$ in., fusiform, pubescent.

Montane zone, above 4000 ft. in grass on open patana land; common. Fl. May, &c.; white.

Throughout India, N. Asia, Burma, Java, Australia, New Zealand.

Very like the 'Ladies'-tresses' (*S. autumnalis*) of the English downs.

50. **CORYMBIS,** *Thouars* (Corymborchis, Bl.).

Tall, terrestrial, rigid, leafy herbs; roots fibrous; l. broad, plaited, base sheathing; fl. in very short stiff spreading axillary panicles; sep. and pet. very narrow, at first cohering in a tube with spreading tips, persistent; lip inserted on the base of the column, erect, linear, channelled, tip dilated and recurved; column nearly as long as the pet., erect, terete, tip clavate, top 2-lobed or 2-auricled, rostellum at length bifid, anticous, 2-lobed; anth. terminal, narrow, erect, acuminate, 2-celled, pollinia long, clavate, granular, grooved, peltately attached by a subulate caudicle to a gland; fr. elongate.—Sp. 6 or 7; 4 in *Fl. B. Ind.*

C. veratrifolia, *Bl. Orch. Archip. Ind.* 125 (1858).
Corymbis disticha, Thw. Enum. 314 (non Thouars). C. P. 3206.
Fl. B. Ind. vi. 91. Bl. l. c. t. 42, f. 1. Ann. Bot. Gard. Calcutt. viii. t. 354.

Stem 4 ft. high, as thick as a swan's quill or thicker, leafy throughout; l. 12–18 by 3–4 in., oval or oval-lanceolate, caudate-acuminate, veins very many and strong, sheath strongly ribbed; panicles 4–6 in. long and broad, bracts ovate-lanceolate; fl. 1–1$\frac{1}{4}$ in. long, erect, sep. and pet. subsimilar, narrowly oblanceolate; lip lanceolate, acuminate, column $\frac{1}{4}$ in. long, slender; fr. sessile, 1$\frac{1}{2}$ in. long, fusiform, erect.

Moist region in low country; very rare. Maturata (Moon); Four Korales. Fl. October; greenish-white, according to Blume's figure.

S. India, E. Bengal, Andaman Is., Malaya.

The Herb. Peraden. specimens are in fruit only Good flowers are wanted to complete the description.—J. D. H.

51. TROPIDIA, *Lindl.*

Tall, terrestrial, leafy herbs, with a woody rootstock and rigid root-fibres; stem simple or branched; l. broad or narrow, strongly veined, bases sheathing; fl. in short terminal spikes, resupinate, bracts narrow, coriaceous, strongly veined, persistent; sep. connivent, dorsal free, lateral broader, more or less connate at the base, forming a mentum with the base of the lip; pet. falcate; lip superior, shorter than the sep., sessile on the base of the column, entire, disk thickened towards the margins, base saccate; column short, stout, rostellum elongate, at length bifid, stigma anticous; anth. dorsal, erect, acute, cells contiguous, pollinia 2, clavate, granular, 2-cleft, pendulous by a slender caudicle from a small gland on the tip of the rostellum; fr. oblong, cylindric.—Sp. 8; 6 in *Fl. B. Ind.*

L. narrowly linear . . . . 1. T. THWAITESII.
L. oval or oval-lanceolate . . . . . . 2. T. BAMBUSIFOLIA.

1. **T. Thwaitesii,** *Hk. f. in Fl. B. Ind.* vi. 93 (1890).
T. curculigoides, Lindl. Gen. and Sp. Orch. 497 (in part); Thw. Enum. 314. C. P. 3565.
Fl. B. Ind. vi. 93.

Rootstock small, branching, root-fibres slender and wiry, or stout, as thick as the stems, woody; stem 6–12 in., slender, about as thick as a duck's quill, clothed with the leaf-sheaths except at the base; l. suberect, 3–6 by $\frac{1}{3}$–$\frac{2}{3}$ in., narrowly linear-lanceolate, acuminate, membranous, 3–5-veined, with many slender intermediate venules; sheaths elongate, strongly ribbed; ped. $\frac{1}{4}$–1 in., with many circular, erect, strongly nerved, empty bracts $\frac{1}{2}$–$\frac{3}{4}$ in. long; spikes subcapitate, many-fld.; bracts as long as the ov., subulate from a short broadly dilated base; dorsal sep. $\frac{1}{6}$ in. long, lanceolate, acuminate, 5-veined, lateral $\frac{1}{4}$ in., ovate-lanceolate, acuminate, 7-veined, connate at the base with the lip in a saccate mentum; pet. shorter and broader than the dorsal sep., falcate, 3-veined; lip much shorter than the sep., ovate, subacute, recurved, with thick intramarginal ridges, margins undulate; anth. linear-oblong, apiculate; fr. $\frac{3}{4}$ in. long, linear-oblong, straight, sessile, strongly 6-ribbed.

Var. **major,** stem stouter, l. 1–2 in., broad, 5–7-veined, fl. larger.

Dry and intermediate regions in high grass; rare. Bintenne; Minery; Polonaruwa; Four Korales. Fl. March, July, November; yellow-green. Endemic.

I am unable from Herbarium specimens to determine accurately the character of the lip, column, and anther.—J. D. H.

2. **T. bambusifolia,** *Trim. Syst. Cat. Ceyl.* 90 (1885).
Cnemidia bambusifolia, Thw. Enum. 314. C. P. 3207.
Fl. B. Ind. vi. 94.

Stem 2–3 ft., as thick as a crow's quill or thicker, lower 12–14 in. naked; l. 4–9 by 1–2¾ in., oval or oval-lanceolate, acuminate or caudate-acuminate, base acute, 5–7-veined, veinlets very slender, sheaths strongly ribbed; spikes stoutly peduncled, ½–2 in. long, stout, clothed with imbricating oval or oblong strongly ribbed coriaceous green sheaths; spike very short, bracts ovate-lanceolate.

Moist region; rare. Adam's Peak (Gardner); Katukande (Thwaites); Lihinigala, Hewesse. Fl. June, July.
Endemic.
The specimens are wanting in fl. and fr.

52. **VANILLA,** *Sw.*

Stem terete, green, branching, climbing by aerial roots, leafy or leafless; l. alt., sessile or subsessile, oblong oval or lanceolate, fleshy or coriaceous, without evident midrib or veins, base not sheathing; fl. large, in short axillary racemes or spikes; bracts short; perianth infundibular, sep. and pet. subequal, spreading and recurved from an erect base; lip erect, inserted on the base of the column which it embraces by a convolute claw, that gradually dilates into an entire trumpet-formed limb with recurved margins, disk with 2 pubescent ridges; column long, narrow; anth. terminal, incumbent, mitriform, deciduous, 2-celled; pollinia free, powdery, oblong, without strap or gland; fr. a long, slender, fleshy, terete or trigonous berry, indehiscent, or at length loculicidally 3-valved. —Sp. 50; 6 in *Fl. B. Ind.*

L. imperfect or o . . . . 1. V. Walkeriæ.
L. 5–7 in. long . . . . 2. V. Moonii.

1. **V. Walkeriæ,** *Wight, Ic.* iii. 3, 1 (1845).
Thw. Enum. 311. Rolfe in Journ. Linn. Soc. xxxii. 474. C. P. 2964.
Fl. B. Ind. vi. 90. Wight, Ic. t. 932.

Stem as thick as the middle finger, flexuous, terete, deeply channelled; l. (arrested) ½–1½ in., lanceolate, acuminate; fl. in very stout many-fld. racemes 5–6 in. long, with broadly ovate, acute bracts, pedicel with ov. 1½–2 in. long; fl. 3 in. broad; sep. 1¾ in. long, broadly oblanceolate, subacute; pet. broader, spathulately obovate, margins thin, waved; lip 1½ in. long, broadly obovate-oblong, undulate, crenate, side lobes o, tip

triangular, acute, disk with two broad pubescent ridges from the base to beyond the middle; fr. 5–6 in., elongate, very slender.

Dry and intermediate regions below 1000 ft., scrambling over bushes; common. Fl. March–June; pure white, hairs on lip orange.
Also in S. India.

2. **V. Moonii,** *Thw. Enum.* 312 (1861). [PLATE XCI.]
Rolfe in Journ. Linn. Soc. xxxii. 461. *V. aromatica* (?), Moon, Cat. 60. C. P. 3204.
Fl. B. Ind. vi. 90.

Stem many feet long, terete, flexuous, as thick as the little finger, deeply channelled; l. 5–7 in., subsessile, oval or linear-oblong, obtusely acuminate, fleshy; fl. crowded on a very stout ped.; bracts short, ovate, subacute; pedicel with ov. $\frac{1}{2}$–$1\frac{1}{2}$ in.; sep. and pet. about 1 in. long, oblong-lanceolate, subacute, spreading from an erect base; lip entire, tube $\frac{2}{3}$ in. long, margins of limb undulate, disk with a broad hirsute band from the upper third to the tip, and a hemispheric tuft of papillæ at the base of the band; fr. linear-oblong, 4 in. long.

Moist region below 2000 ft., in thick jungle; rather rare. Kalutara; Galle; Heneratgoda, abundant; Hunasgiriya. Fl. April; sep. and pet. buff-coloured, lip yellowish-white; a very pretty orchid.
Endemic.
The officinal Mexican Vanilla (*V. planifolia*, Andr.), cultivated in Ceylon, may be recognised by its pale-green fl., linear-oblong sep. and pet., the lip adnate to the sides of the column, and column villous in front.—J. D. H.

53. GASTRODIA, *Br.*

Terrestrial, leafless, pale or brown herbs, (saprophytes?) with tuberous rootstock, and sheaths on the simple stem; fl. in terminal lax racemes; sep. connate with the pet. in a ventricose 5-lobed tube or sac, cleft in front; lip inserted on the foot of the column and to the base of the tube of the perianth included, entire, spur 0; column long, narrow, sides narrowly winged towards the top, base produced into a long or short foot, stigma prominent, anticous; anth. terminal, very convex, erect, 2-celled, pollinia 2, pyriform, free, coarsely granular, without strap or gland.—Sp. 9; 5 in *Fl. B. Ind.*

G. javanica, *Lindl. Gen. and Sp. Orch.* 384 (1840).
Thw. Enum. 311. C. P. 311.
Fl. B. Ind. vi. 123. Bl. Bijd. v. t. 4 (*Epiphanes javanica*).

Rootstock very slender, creeping, straight or flexuous, swelling here and there into globose or ovoid tubers $\frac{1}{6}$ in. diam., and provided with tuberiferous rootlets; stem 3–6 in., erect,

straight or flexuous, naked or with a few empty bracts above; raceme 3–6 in., elongating much during flowering; bracts very small, orbicular, pedicel with ov. $\frac{1}{2}$–$\frac{2}{3}$ in.; fl. about $\frac{1}{2}$ in. long and broad; lip articulate with the foot of the column, shorter than the sep., broadly oblong, tip rounded, base with a large bifid callus.

Moist region below 2000 ft.; very rare. Hiniduma Kande, Pasdun Korale; Karawita Kande, near Ratnapura; near Eratne. Fl. Feb.–April; white, slightly tinged with violet.

Also in Java.

Apparently a saprophyte, attaching itself to dead leaves by root-suckers. There is some doubt whether this is really the Java species.

54. **EPIPOGUM,** *Gmel.*

Terrestrial, leafless, pale brown or white herbs (saprophytes?) with tuberous rootstock, and a simple sheathed stem; fl. in terminal lax racemes; sep. and pet. subequal, narrow, spreading; lip inserted at the base of the column, about as long as the sep., entire, oblong, base spurred, disk with glandular ridges, spur short, obtuse; column short, strongly incurved, truncate, stigma anticous; anth. horizontal, tumid, dorsally thickened, 2-celled; pollinia 2, pyriform, bifid, coarsely granular, each with a slender caudicle, but no gland. —Sp. 2; 1 in *Fl. B Ind.*

E. nutans, *Lindl. in Journ. Linn. Soc.* i. 177 (1857).
Thw. Enum. 311. C. P. 3205.
Fl. B. Ind. vi. 124. Wight, Ic. t. 1759 (*Podanthera pallida*). Ann. Bot. Gard. Calcutt. viii. t. 335.

Rootstock an oblong-ovoid tuber, 1–3 in. long, marked with close set scars; stem 15–20 in., stout, up to $\frac{1}{3}$ in. diam. at the base, cylindric, hollow, bearing many appressed broad papery scales; raceme 3–8 in., lax-fld., rhachis stout, bracts about $\frac{1}{4}$ in., as long as the slender decurved pedicels, lanceolate, acuminate; sep. and pet. similar, $\frac{1}{2}$–$\frac{3}{4}$ in. long, about as long as the ov., linear-lanceolate, acute; lip rather longer than the sep., ovate, acute, tip recurved, serrulate, spur much shorter than the lip.

Moist region below 2000 ft., in damp shady places; rather rare. Hantane; Rangala; Peradeniya, B. G., a rather frequent weed in the beds under trees. Fl. Jan., May, July; like the rest of the plant, quite white or speckled with red.

S.W. India, E. Bengal, Java, Australia, W. Africa.

A root-parasite or saprophyte; the short rhizome, like the stem, is hollow at flowering time.

55. **GALEOLA,** *Lour.*

Leafless, fleshy, erect, yellow or brown saprophytes, with scale-like l.; fl. in loose terminal panicles or racemes, rather large; sep. subequal, concave, connivent, at length spreading; pet. like the sep., but smaller; lip sessile, and adnate to the base of the column, which it embraces by its base, shorter than the sep., broad, concave, entire or 3-lobed, fleshy, spur 0, disk bearded; column short, incurved, dilated above with membranous wings; anth. terminal, conical, 2-celled, opercular, deciduous, cells 2-locellate, pollinia 2, oblong, powdery, grains ellipsoid, without caudicle or gland; fr. a fleshy indehiscent berry.—Sp. 8 or 9; 7 in *Fl. B. Ind.*

G. javanica, *Benth. in Gen. Pl.* iii. (590).
Cyrtosia javanica, Bl., Thw. Enum. 311. C. P. 3203.
Fl. B. Ind. vi. 88, 197. Bl. Rumph. i. t. 69 (*Cyrtosia*).

Roots of clavate or cylindric fascicled, fleshy fibres, 1–2 in. long; stems many from the root, 4–6 in. high, simple or sparingly branched, glabrous and shining below, papillose above, dull red purple in age; scales alternate, ovate, the colour of the stem; fl. loosely spicate, about $\frac{1}{2}$ in. diam., nodding, rose-cold, turning yellow-brown; sep. and pet. erecto-connivent, subsimilar, oblong, acute, membranous, deciduous, sep. rather the longest; lip shorter, broader, and much thicker than the sep., semi-rotund, concave, sulphur-cold, disk thickened, bearded and ribbed; base of column thickened, gibbous above, dilated, fornicate, with 2 short, lateral, rounded, erose wings, rostellum short; berry about 2 in. long, sausage-shaped, terete, pendulous.

Moist region 2–3000 ft.; very rare. Pasbage (Gardner); Pundaluoya, at the roots of coffee-trees (Nietnez); Ramboda (Thwaites). Fl. pale-green, the column yellow.

Also in Java and Assam.

In a note Dr. Trimen says: 'I have never met with this very singular plant.' The only specimen in Herb. Peraden. is quite unfit for examination, being shrivelled up. There is a drawing of it in the collection, representing a young specimen with imbricating scales, and the flowers in a head, the sep. and pet. green, column and lip golden-yellow. The description given above is from Blume.—J. D. H.

56. **APHYLLORCHIS,** *Bl.*

Pale, leafless saprophytes, with fleshy rootstocks or roots; stem simple, stout, or slender, with membranous sheaths; fl. in terminal racemes; sep. 3, subequal, connivent or spreading; pet narrower; lip as long as the sep., inserted

at the base of the column, entire, or lobed at the base, spur 0; column rather long, arched, truncate, stigmatic disk anticous below the tip; anth. terminal, suberect, orbicular, operculate, persistent, 2-celled, cells contiguous, pollinia 4, oblong, united in pairs, granular, without strap or gland.—Sp. 5 or 6; 4 in *Fl. B. Ind.*

A. montana, *Rchb. f. in Linnæa*, xli. 57 (1877).
Apaturia montana, Thw. Enum. 301 (non Lindl.). C. P. 3189.
Fl. B. Ind. vi. 116. Ann. Bot. Gard. Calcutt. viii. t. 349.

Quite glabrous; stem 2–3 ft. high, purplish, stout or slender, naked, base clothed with oblong scales $\frac{1}{6}$–$\frac{1}{3}$ in. long and broad; roots vermiform, 2–3 in. long, as thick as the rootstock; raceme 4–8 in., lax-fld.; bracts linear-lanceolate, acute or obtuse, membranous, shorter than the ov., reflexed, pale, persistent; ov. with the spreading pedicel $\frac{2}{3}$–1 in.; sep. $\frac{1}{2}$–$\frac{2}{3}$ in. long, linear-oblong, obtuse, dorsal arching, lateral adnate to the base of the lip; pet. narrower than the sep., subfalcate; lip with a small two-lobed, saccate, hypochile, the lobes triangular, erect, and a large, ovate, veined, naked, 2-lobed epichile, attached to the hypochile by a very narrow neck, with 2 small calli at the juncture; column slightly swollen at the truncate top, rostellum 0; anth. attached by a broad base, persistent; fr. 1 in. long, oblong-fusiform, pedicel slender.

Moist low country below 2000 ft.; rare. Ambagamuwa; near Ratnapura; Hewesse. Fl. Feb., April, August; pale lemon-yellow, tinged, as is the whole plant, with purple.

Also in Sikkim Himalaya.

I have never met with this curious plant, which appears to be saprophyte or root parasite. *Apaturia montana* of Lindley, to which Thw. refers this, is a very different plant (*Pachystoma senile*).—*Trimen.*

57. POGONIA, *Griff.*

Terrestrial, tuberous, scapigerous herbs, leafing after flg.; l. usually solitary, long-petioled, broad, membranous, plaited, flabellately veined; fl. solitary or racemed, horizontal or pendulous; sep. and pet. subequal, connivent or widely spreading; lip inferior, inserted at the base of the column, spurred or saccate at the base, entire or three-lobed, disk without calli or crests; column long, slender, top clavate, rounded or truncate, stigmatic surface anticous; anth. terminal, horizontal, imperfectly 2-celled, pollinia 2, granular, entire or cleft, without gland or caudicle.—Sp. about 40; 10 in *Fl. B. Ind.*

P. juliana, *Wall. Cat. n.* 7399 (1828).
Thw. Enum. 430. C. P. 3841.
Fl. B. Ind. vi. 119. Hook. Ic. Pl. t. 2194.

Tubers globose, ½–1 in. diam., white; stem 2–3 in., white, erect, giving off a few vermiform roots above the tuber, a solitary leaf-bud and a long flowering scape; l. developing after the flowering of the scape, petioled, broadly ovate-cordate, acute, about 2 in. diam., membranous, plicate with 5–7 veins radiating from the top of the petiole, green or purplish beneath; petiole short, with a few acute sheaths at the base; scape 5–6 in., with several convolute sheaths, the upper longest; fl. solitary, shortly pedicelled, 1 in. broad, bracts shorter than the ov.; sep. and pet. narrowly lanceolate, acuminate; lip longer than the sep., side lobes small, oblong, toothed, terminal oval from a narrow base, disk pubescent between the lobes.

Dry country; rare. Near Haragama and Uma-oya, Dumbara; Nilgala, Uva, abundant. Fl. October; sep. and pet. green, side lobes of lip white, mid lobe pale pink, mottled with red.

Assam, Sylhet, Lower Bengal.

There is in Herb. Peraden. a drawing and a flowering specimen of a plant that may be *Pogonia juliana;* but without leaves it is impossible to be sure that it is that species. On the other hand, there are, in the Peraden. Herb., leaves from several localities of plants named *P. juliana* which differ entirely from the leaves of the Bengal plant, being orbicular with many radiating veins; but none resemble those of true *P. juliana.* In describing *P. juliana* as a native of Ceylon, I am following Thwaites and Trimen's catalogues.—J. D. H.

58. **HABENARIA,** *Willd.*

Terrestrial leafy herbs with undivided or lobed tubers, and fleshy radical fibres; l. not plaited, bases sheathing; fl. spicate or racemed; sep. subequal or the dorsal shortest, lateral ascending spreading reflexed or deflexed; pet. smaller or larger, simple, or cleft (sec. *Ate*); lip continuous with the base of the column, entire 3-lobed or 3-partite, base spurred; anth. adnate to the very short column, cells parallel or divergent below, bases often produced into a long or short tube; pollinia 2, clavate or pyriform, granular, caudicle long, short, or 0, sometimes winged, terminated by an exposed gland; staminodes on the side of the column, glandular, rarely elongate; stigma a single or double viscid area on the column below the anth., or two globose or clavate processes; rostellum usually small and erect between the cells of the anth., rarely obsolete; fr. capsular.—Sp. about 400; 112 in *Fl. B. Ind.*

Tubes of anth.-cells elongate.
Pet. bifid or bipartite (*Ate*).
Pet. bifid, margins tomentose . . . . 1. H. BARBATA.
Pet. bifid, glabrous . . . . 2. H. ACUMINATA.
Pet. bipartite.
Spur shorter than the ov. . . . . 3. H. MACROSTACHYA.
Spur as long or longer than the ov.
Lower segm. of pet. shorter . . . 4. H. DOLICHOSTACHYA.
Segm. of pet. subequal . . . . 5. H. DICHOPETALA.
Pet. entire.
Side lobes of lip broad, mid lobe narrow.
Sep. small, acute . . . . . . 6. H. PLANTAGINEA.
Sep. broad, obtuse . . . . . 7. H. CRINIFERA.
Side lobes of lip very narrow.
Lip twice as long as the sep. . . . 8. H. PTEROCARPA.
Lip as long as the sep. . . . . . 9. H. RHYNCHOCARPA.
Tubes of anth.-cells very short or 0.
Spur very long, slender . . . . . 10. H. VIRIDIFLORA.
Spur short.
Lip entire or nearly so, spur globose.
Lip longer than the sep., orbicular . 11. H. BREVILOBA.
Lip shorter than the sep. . . . . 12. H. WIGHTII.
Lip 3-lobed or 3-partite.
Sep. and pet. membranous.
Spur clavate . . . . 13. H. ARISTATA.
Spur globose . . . . 14. H. TRIMENI.
Sep. and pet. thick, fleshy.
Spur globose.
Spur sessile . . . . . . 15. H. TORTA.
Spur stipitate . . . . . . 16. H. GARDNERI.
Spur short, cylindric . . . . . 17. H. CUBITALIS.

1. **H. barbata,** *Wight in Wall. Cat. n.* 7034 (1828).

Ate virens, Lindl., Thw. Enum. 309. Trim. Syst. Cat. Ceyl. 91. C. P. 3200.

Fl. B. Ind. vi. 133. Wight, Ic. t. 928.

Stem 10–12 in., rather stout, leafing above the middle, sheathed below it, tubers oblong or pyriform ; l. 3–5, erect, lanceolate, acuminate, 5–7-veined, bases sheathing ; raceme lax-fld. ; bracts large, as long as the fl., lanceolate, acuminate, sheathing the ov. ; fl. $\frac{3}{4}$ in. broad, sep. ovate, acuminate, 5-veined, glabrous or puberulous, dorsal horizontal, concave, lateral spreading or reflexed, narrowly falcate, oblong ; pet. much broader than the sep., bifid, sinus broad, rounded, margins tomentose, upper lobe the longest ; tip filiform, lower broader, acuminate ; lip longer than the sep., linear, trifurcate at the end, scaberulous, segm. subulate, spur as long as the ov., mouth with a long recurved ligule ; anth.-cells parallel, tubes as long as the cells, upcurved, pollinia clavate, caudicles long, glands small ; staminodes short, stout, capitate ; rostellum obtuse ; stigmatic processes long, spreading ; fr. $\frac{3}{4}$ in. long, linear-oblong.

Lower montane zone at about 4000 ft.; very rare. Maturata Fort (Thwaites); Hakgala (Nock). Fl. Dec., Jan.; yellowish-green, the lip pale yellowish-brown.
Also in Travancore.

2. **H. acuminata,** *Trim. Cat. Ceyl. Pl.* 91 (1885).
Ate acuminata, Thw. Enum. 309. C. P. 514.
Fl. B. Ind. vi. 133.

Stem 1–2 ft., leafy, leafing above the middle, sheathed below it; tubers oblong; l. 2–4 in., erect, lanceolate, and as the large cymbiform bracts setaceously acuminate, indistinctly 5–7-veined, bases sheathing; raceme elongate, lax-fld.; bracts erect, cymbiform, sheathing the fl., green; fl. subsecund, ½ in. broad, glabrous; sep. spreading, dorsal hemispheric, lateral broadly ovate, obtuse, or suborbicular; pet. 2-lobed to the middle, lobes variable in length and breadth, incurved, upper slender, longer than the dorsal sep., and about twice as long as the subulate lower; lip as long as the sep., broadly 3-lobed, lobes variable in length, fleshy, obtuse, spur longer than the ov., narrowly clavate, mouth with a ligula; anth.-cells spreading below, tubes recurved, pollinia clavate, as long as their caudicles, glands minute; staminodes short, fleshy; rostellum small, triangular; stigmatic processes large, globose.

Among grass on patanas, lower montane zone 3–5000 ft.; rather common. Dimbula; Ramboda; Hantane; Galagama; top of Doluwa Kande. Fl. Oct.–Dec.; sep. green, pet. yellow-green or purple, lip purple.
Endemic.

3. **H. macrostachya,** *Lindl. Gen. and Sp. Orch.* 307 (1835).
Thw. Enum. 309. C. P. 3197.
Fl. B. Ind. vi. 134.

Stem 1½–3 ft., robust, leafy about the middle, closely sheathed below it; l. 5–7 by 2–3 in., oval obovate or oblanceolate, acute, many-veined, and with cross venules, narrowed into a broad petiole 1–3 in. long; raceme 6–10 in., laxly many-fld., rhachis stout, channelled; bracts narrowly lanceolate, as long as the narrow decurved ov., 1–1¼ in. long; sep. ¾ in. long, ovate-lanceolate, finely acuminate, dorsal erect, lateral deflexed under the lip; pet. nearly as long as the sep., bipartite, erect, segm. subequal, or the lower shorter, filiform, sinus acute; lip longer than the sep., 1 in. long, 3-partite, segm. subequal, filiform, lateral spreading with recurved tips, terminal straight, spur shorter than the ov., very slender, thickened downwards, mouth with a ligula; anth.-tubes as long as the parallel cells, suberect, pollinia pyriform, glands minute; rostellum small; stigmatic processes long, slender, adnate to the mouth of the spur.

Low country up to 3000 ft. in both regions; rather common. Hantane; Peradeniya; Dolosbagie; near Kégalla; E. Matale; Bintenne; Bibile. Fl. Oct.–Jan.; sep. whitish-green, pet. and lip purple-brown.
Also in Travancore.

4. **H. dolichostachya,** *Thw. Enum.* 309 (1861).
C. P. 3199.
Fl. B. Ind. vi. 135.

Stem 2–3 ft., slender, leafless below; tuber oblong and root-fibres clothed with matted root-hairs; l. rather distant, 2–3 in. long, oblong-lanceolate, acuminate, many veined, base amplexicaul; raceme 8–12 in., laxly many-fld., rhachis stout, channelled; bracts as long as the fl., ovate-lanceolate, acuminate; fl. subsessile, about $\frac{1}{3}$ in. broad, ov. $\frac{1}{2}$ in., slender, decurved, almost beaked, sep. all spreading, 3-veined, dorsal orbicular-ovate, concave, mucronate, lateral $\frac{1}{4}$ in., ovate or ovate-lanceolate, acute; pet. erect, bipartite, segm. filiform or subulate, lower shorter, sinus rounded; lip $\frac{1}{3}$ in., longer than the sep., tripartite, segm. filiform, $\frac{1}{2}$ in., middle longest, lateral spreading, spur slender, nearly as long as the ov., mouth with a short ligula; anth. broad, cells parallel, tubes long, upcurved, pollinia clavate, caudicles slender, glands small; rostellum short, triangular; stigmatic processes clavate, curved round the mouth of the spur.

Montane zone 3–6000 ft.; rare. Ramboda; Bogawantalawa; Hakgala. Fl. Oct.–Dec.; green.
Endemic.

5. **H. dichopetala,** *Thw. Enum.* 309 (1861).
C. P. 3564.
Fl. B. Ind. vi. 136.

Stem 1–2 ft., robust, leafy about the middle; tubers globose, as large as a hazel nut, and root fibres matted with root-hairs; l. 2–3 in. long, very shortly petioled, ovate or ovate-lanceolate, acute, 7–9-veined, dark green; raceme many- and lax-fld.; bracts $\frac{1}{2}$–$\frac{2}{3}$ in., ovate-lanceolate, acuminate; fl. about $\frac{1}{2}$ in. across the sep., ov. with pedicel $\frac{2}{3}$–1 in., sep. spreading, 3-veined, dorsal erect, broadly ovate, hooded, lateral ovate, acute; pet. bipartite, segm. subequal, as long as the sep., divaricate, narrowly linear or subulate, sinus rounded, tips sometimes revolute; lip tripartite to the base, 1 in. long, segm. equal or median longest, filiform, or flattened and falcate, straight, or tips of lateral revolute, spur $\frac{2}{3}$ in., as long as the ov., slender, pendulous, incurved, clavate towards the subacute tip, mouth minute, anth.-cells distant, tubes rather short, ascending, pollinia clavate, glands small; staminodes pulvinate; rostellum short; stigmatic processes large, clavate, glandular.

Dry region; rather rare. Anuradhapura; Bintenne; Bibile; Nilgala. Fl. Nov.–Jan.; sep. and pet. greenish, lip yellow.
Endemic.

6. **H. plantaginea,** *Lindl. Gen. and Sp. Orch.* 323 (1835).
Thw. Enum. 310. C. P. 2374.
Fl. B. Ind. vi. 141. Wight, Ic. t. 1710.

Scapigerous; stem very short; tubers oblong; l. 3–6 in., narrowly oval or oblong, acute, spreading, membranous, narrowed at the base into a short sheath, veins many, slender; scape 8–12 in., slender, with many rather distant, open, lanceolate, acuminate sheaths $\frac{1}{2}$–1 in. long; spike 4–6 in., lax-fld.; bracts subulate-lanceolate, much shorter than the ov.; ov. $\frac{2}{3}$–1 in. long, slender, beaked; fl. subsecund, about $\frac{2}{3}$ in. broad, across the spreading sep.; sep. $\frac{1}{6}$ in. long, subequal, 3-veined, acute, dorsal ovate-oblong, lateral falcately oblong; pet. linear-lanceolate; lip more than twice as long as the sep., flabelliform from a narrow claw, puberulous, $\frac{1}{3}$–$\frac{2}{3}$ in. broad, 3-lobed; lobes subacute, entire or toothed, lateral $\frac{1}{2}$-ovate, mid lobe as long, narrowly linear, spur 1–1$\frac{1}{2}$ in., very slender, pendulous; anth. rather broad, cells divergent below; tubes rather short, upcurved, meeting at their tips, pollinia pyriform, as long as their broad caudicles, which are inserted upon an at first apparently simple, entire, lanceolate, concave gland, which divides longitudinally; staminodes on the sides of the anth., pulvinate; rostellum broad, triangular; stigmatic processes prominent, clavate; fr. $\frac{2}{3}$ in. long, turgidly fusiform, curved, beak short, slender.

Dry region; common. Fl. April; pure white.
Also in Peninsular India.
A pretty plant, often called 'Pigeon-orchid' by the English. The late cohesion of the glands of the pollinia is unique in the genus, so far as is recorded.—J. D. H.

[*H. Lindleyana*, Steud. (*H. latifolia*, Lindl.), a very little-known plant, is given from 'Ceylon, Macrae,' by Lindl. (Gen. and Sp. Orch. 321). No one else has found it, and the locality is probably an error (see Fl. B. Ind. vi. 140.)]

7. **H. crinifera,** *Lindl. Gen. and Sp. Orch.* 323 (1835).
Thw. Enum. 310. C. P. 207.
Fl. B. Ind. vi. 142. Wight, Ic. t. 926.

Scapigerous, stem 2–6 in., naked and rooting below; tuber large, ovoid; l. 3–6 in., oblong-lanceolate, acuminate, spreading, sheathing broadly below, veins many; scape 8–12 in., slender, with many rather large lanceolate sheaths 1–1$\frac{1}{2}$ in. long, the lower foliaceous; raceme short, few-fld.; bracts $\frac{2}{3}$ in., ovate-lanceolate, with capillary tips, half as long as the slender ov., which terminates in a decurved slender beak; fl. $\frac{1}{2}$ in. across

the spreading 3-veined sep., dorsal sep. hemispheric, lateral broadly ovate-oblong, obtuse; pet. erect, linear; lip three times as long as the sep. or longer, clawed, 3-lobed, side lobes cuneiform, outer margin toothed, and with a slender tail as long as itself produced from the inner margin, mid lobe clawed, cleft into two lanceolate long-tailed segments as long as the side lobes, spur 1½ in., as long as the ov., very slender, strongly incurved, mouth with a long ligule; anth.-cells parallel, tubes long, straight, pollinia oblong, much shorter than the slender caudicles, which become compressed and winged on one side, ending in an obliquely truncate acute tip, glands very small; rostellum short, obtuse; stigmatic processes clavate, adnate to the mouth of the spur; fr. 1–1¼ in., fusiform, beak very slender.

Moist region to 3000 ft.; rather rare. Hantane; Galagama. Fl. Feb.; sep. greenish, pet. and lip white.

Also in S. India.

8. **H. pterocarpa,** *Thw. Enum.* 309 (1861).
C. P. 3201.
Fl. B. Ind. vi. 145.

Stem 6–18 in., stout, leafy throughout; tubers oblong; l. 4–10 in., oblong or linear-lanceolate, many-veined, base sheathing; raceme short, 3–10-fld.; bracts ovate-lanceolate, finely acuminate, nearly as long as the straight erect, shortly beaked ovary, which with the short, straight pedicel is 1–1¼ in. long; fl. 1½–2 in. broad across the spreading 5-veined sep.; dorsal sep. erect, ovate-oblong, acute, hooded, lateral rather longer, oblong-lanceolate, acuminate, falcate, spreading or deflexed; pet. linear-oblong, falcate, forming a hood with the dorsal sep.; lip 1 in. long, twice as long as the sep. or more, 3 cleft to above the middle, side lobes subulate-lanceolate, recurved or ascending, longer than the straight subulate mid lobe, which has deflexed sides; spur 3½ in., narrowly clavate, mouth with a tooth; anth.-cells divaricate below, tubes as long as the cells, pollinia narrowly pyriform, caudicles as long, narrowly winged on one side, glands very small; rostellum triangular; stigmatic processes elongate, clavate; fr. (immature) 6-winged.

Moist region 2–4000 ft.; rare. Ambagamuwa; Ramboda; also at Dambulla in the dry region. Fl. Oct.; white, with the spur green.

Endemic.

Our largest-flowered species.

9. **H. rhynchocarpa,** *Trim. Syst. Cat. Ceyl.* 91 (1885).
H. stenopetala, Lindl. Gen. and Sp. Orch. 324 (not of 319). *Platanthera rhynchocarpa*, Thw. Enum. 310. C. P. 3058.
Fl. B. Ind. vi. 145.

Stem 1–2 ft., leafy at the base and upwards; tubers large, clavate; l. 2–6 in., sessile, lanceolate or oblong-lanceolate, acute or acuminate, many-veined, base sheathing; spike 2–3 in., dense-fld.; bracts about 1 in. long, as long as the long slender beaked ov. or longer, narrowly lanceolate, finely acuminate; fl. $\frac{1}{2}$–$\frac{2}{3}$ in. across the spreading or deflexed 3-veined lateral sep.; dorsal sep. cymbiform, acute, shorter than the oblique broadly ovate or orbicular subacute, deflexed lateral, pet. linear, forming a hood with the dorsal sep.; lip hardly as long as the lateral sep., narrow, 3-lobed to the middle, lobes decurved, subulate or linear-lanceolate, acute, median longest, spur 1–1$\frac{1}{4}$ in., cylindric, obtuse, mouth with a small tooth; anth.-cells divaricate below, tubes nearly straight, pollinia clavate, caudicles long, glands minute; rostellum minute; stigmatic processes elongate, incurved, adnate to the mouth of the spur; fr. fusiform, nearly 1 in. long, including the slender decurved beak, which is nearly as long as the strongly ribbed body.

Moist and intermediate region 2–4000 ft.; rare. Galagama and Bilahuloya; Lunagala; Uma-oya. Fl. Nov.–Feb.; white, end of spur green. Endemic.

Lindley named two species *H. stenopetala*, hence that name is dropped.

10. **H. viridiflora,** *Br. Prodr.* 312 (1810).
Orchis viridiflora, Sw., Moon, Cat. 59. Thw. Enum. 309. C. P. 2372. Fl. B. Ind. vi. 150. Wight, Ic. t. 1705.

Scapigerous, stem short; tubers $\frac{3}{4}$–1 in., ovoid or oblong; l. few or many, chiefly radical, 2–4 in., linear-lanceolate, acute or acuminate, coriaceous, margins not thickened, veins obscure, base sheathing; scape 4–14 in., slender, with many lanceolate sheaths; raceme closely or laxly many-fld.; bracts $\frac{1}{6}$ in., much shorter than the ($\frac{3}{4}$ in.) beaked ov., lanceolate, finely acuminate; fl. $\frac{1}{4}$–$\frac{1}{3}$ in. across the spreading 3-veined sep., coriaceous or rather fleshy; dorsal sep. short, orbicular-ovate, or hemispheric, lateral much longer, $\frac{1}{8}$–$\frac{1}{4}$ in. long, broadly obliquely ovate, obtuse, spreading or reflexed; pet. broadly obliquely ovate, as long as the dorsal sep.; lip longer than the sep., 3-partite, segm. variable in length, thickly subulate, lateral recurved, terminal shorter, straight, spur as long as the ov., slightly thickened towards the end, mouth narrow, thickened on each side by the adnate bases of the long stigmatic processes; anth.-cells short, divaricate below, tubes short, up curved, pollinia pyriform, caudicles very short, glands rather large; rostellum minute; stigmatic processes long, clavate, projecting beyond the mouth of the spur; fr. erect, $\frac{2}{3}$ in.

long, fusiform, straight or curved, thickly ribbed, narrowed into an inclined beak, pedicel $\frac{1}{4}$ in. or less.

Low country in both regions, often in paddy fields; common, rarely extending into montane zone. Fl. Dec.–Feb.; green.

Also in Indian Peninsula.

Thwaites erroneously gives this as a high montane plant.

11. **H. breviloba,** *Trim. Syst. Cat. Ceyl.* 91 (1885).
Peristylus brevilobus, Thw. Enum. 311. C. P. 3493.
Fl. B. Ind. vi. 159.

Stem with spike 6–18 in., slender, leafy at the base only or upwards; tubers oblong; l. 2–3 by $\frac{2}{3}$–$\frac{3}{4}$ in., oblong-lanceolate, acuminate, rather coriaceous, base sheathing, veins very slender, sheaths of upper long, of lower short; spike 2–3 in., oblong, rather dense-fld.; bracts about as long as the ov., membranous, obtuse, sep. and pet. connivent, 1-veined, obtuse, dorsal sep. $\frac{1}{4}$ in., linear-oblong, lateral narrower; pet. broader than the sep., broadly oblong, tips rounded, veins branching; lip longer than the sep., claw keeled in the centre above, dilating into an orbicular or subflabelliform entire veined limb $\frac{1}{4}$ in. broad, spur a minute inflated incurved shortly pedicelled sac; anth. very small, cells parallel, tubes 0; rostellum bifid, concealing the glands of the pollinia; stigmatic processes 0.

Moist low country below 3000 ft.; rare. Near Ratnupura; Dolosbagie; Ambagamuwa. Fl. Sept.

Endemic.

12. **H. Wightii,** *Trim. Syst. Cat. Ceyl.* 91 (1885).
Herminium plantagineum, Lindl. in Bot. Reg. xviii. sub t. 1499.
Peristylus plantagineus, Lindl. Gen. and Sp. Orch. 300; Thw. Enum. 310.
No C. P. number.
Fl. B. Ind. vi. 162. Wight, Ic. t. 921. Bot. Mag. t. 3397 (*H. goodyeroides*).

Stem with the spike 1–2 ft., robust, leafy chiefly about the middle, closely embraced with many long narrowly lanceolate sheaths above the l., with loose sheaths below them; tubers large, cylindric-oblong; l. 5–7 by $2\frac{1}{2}$–3 in., oblong-lanceolate, acuminate or acute, wavy, strongly veined beneath; base subamplexicaul, sheaths tight; spike 4–8 in., narrow, dense-fld.; bracts $\frac{1}{3}$ in., longer than the fl., erect, very narrowly lanceolate, acuminate; fl about $\frac{1}{6}$ in. broad, ov. erect; sep. connivent, obtuse, dorsal broadly ovate, lateral rather longer, oblong, apiculate below the tip; pet. very broad, obliquely orbicular, tips recurved, veins branched; lip about as long as the sep., broadly obovate, shortly 3-lobed, lobes obtuse, contracted beyond the very broad, concave base, spur very small, globose; anth. short, cells parallel, tubes short, recurved,

pollinia clavate, caudicles short, glands small; staminodes large; rostellum short, acute; stigmatic processes short, stout.

Ceylon (Macrae). Fl. (?); sep. greenish, lip and pet. white.
Also in S.W. India.

The only Ceylon specimen seen is Macrae's, in Herb. Lindley.; there is, however, a drawing of a small state in Herb. Peraden., without locality. I doubt *H. Wightiana* being distinct from the Himalayan *H. goodyeroides*. —J. D. H.

13. **H. aristata,** *Trim. Syst. Cat. Ceyl.* 91 (1885) in part.
Peristylus aristatus, Lindl. Gen. and Sp. Orch. 300; Thw. Enum. 310 (in part). C. P. 3081.
Fl. B. Ind. vi. 158. Wight, Ic. t. 1698 (*Peristylus exilis*). Ann. Bot. Gard. Calcutt. viii. t. 409.

Stem with the spike 1½–2 ft., very slender, leafy about the middle, and with a few narrow sheaths above; root of fleshy fibres; l. 3–6 in. long, sessile or narrowed into a short broad petiole, oval-lanceolate, acuminate, membranous, 3-veined, sheath short, loose; spike 6–10 in., very slender, lax-fld., quite glabrous; bracts ⅓ in., lanceolate, shorter than the slender beaked suberect ov.; fl. about ¼ in. broad, membranous; sep. subequal, obtuse, 1-veined, dorsal linear-oblong, erect, concave, lateral oblong-lanceolate, spreading or reflexed; pet. rather shorter than the sep., forming a hood with the dorsal sep., ovate, subacute, 1-nerved; lip nearly twice as long as the sep., very variable in length, clawed, limb hastately tripartite, side segm. filiform, falcately incurved, with often revolute tips, mid segm. shorter, more slender, straight; spur clavate or fusiform, about as long as the lip or shorter; anth. minute, cells parallel, tubes 0, pollinia minute, pyriform, of few grains, caudicles very short, glands small; rostellum obscure; stigmatic processes at the mouth of the spur, clavate; fr. erect, nearly ½ in. long, fusiform, very shortly beaked.

Montane zone above 4000 ft.; rather common. Ramboda; Dolosbagie; Pedurutalagala. Fl. Sept. Oct.; pale green.
Also in the Himalaya, Burma, and S. India.

14. **H. Trimeni,** *Hook. f.*
H. goodyeroides, Herb. Peraden. (non Don).

Stem with the spike 12–24 in., leafy towards the base only or upwards; tubers oblong or cylindric; l. 3–5 by 1½–2½ in., oval, acute, many-veined, base sheathing; ped. 3–6 in., with scattered lanceolate sheaths; spike 2–7 in., oblong, dense-fld.; bracts ⅙–¼ in., lanceolate, longer than the slender beaked ov.; fl. ¼ in. long, sep. and pet. membranous, obtuse; sep. linear-oblong, 1-veined, veins slightly thickened (or of the lateral spurred) dorsally below the tip; pet. longer and broader than the sep., oblong, tip rounded, veins 3, very slender; lip longer

than the pet., claw dilating into a 3-partite flat membranous strongly veined limb, lobes nearly equal in length, lateral subulate-lanceolate, 1-veined, slightly divergent from the ovate, or ovate-lanceolate 3-veined mid lobe, sinus acute, spur globose, sessile or very shortly pedicelled; anth. small, globose, tubes 0, pollinia pyriform, sessile on the large oblong glands; stigmatic processes short.

Uma-oya (1879). Fl. Dec.; white.

Endemic.

There are two drawings by Alwis of this plant in Herb. Peraden. One represents the stem 2 ft. high, as thick as a swan's quill, the l. 5 by $2\frac{1}{2}$ in., the spike 7 in., and the fl. $\frac{1}{2}$ in. long; it is named *H. goodyeroides* (?). The other, dated 17 Dec. 1879, represents a much smaller plant, with l. 3 by $1\frac{1}{4}$–2 in. The nearest ally of the species is *H. constricta*, Hb. of the Himalaya and Tenasserim, which has much larger fl. and many veins on the broader lip.—J. D. H.

15. **H. torta,** *Hk. f. in Fl. B. Ind.* vi. 159 (1890).

Peristylus spiralis, A. Rich., Thw. Enum. 310. *H. spiralis*, Trim. Syst. Cat. Ceyl. 91 (non A. Rich). C. P. 226 (part).

Fl. B. Ind. vi. 159. Wight, Ic. t. 1696.

Stem with the spike 6–18 in., slender, often flexuous, leafy towards the base or upwards, with many lanceolate sheaths above the l.; tubers small, oblong, pyriform, or globose; l. 1–$2\frac{1}{2}$ in., linear-lanceolate, obtuse, acute, or acuminate, upper passing into the stem sheaths, coriaceous, 5–7-veined, base sheathing; spike 2–10 in., slender, lax-fld., twisted spirally; bracts $\frac{1}{4}$-$\frac{1}{3}$ in., lanceolate, lower longer than the ov.; fl. secund, very variable in size, sep. and pet. $\frac{1}{10}$–$\frac{1}{8}$ in. long, subequal, obtuse, or dorsally apiculate, 1-veined, dorsal sep. oblong or linear-oblong, concave, lateral linear, falcate, reflexed; pet. ovate or linear-oblong; lip very variable, rather longer than the sep., cuneate, 3-cleft to about the middle, fleshy, claw broad, lobes very variable, short, obtuse, lateral spreading or not, median usually shorter, broader, and strongly recurved, spur a minute globose sac; anth. minute, cells parallel, tubes 0, pollinia pyriform, caudicle short, glands oblong; rostellum 3-fid; stigmatic processes clavate.

Montane zone above 4000 ft.; rather common. Galagama; Dolosbagie; Pedurutalagala; Dimbula. Fl. Sept.; greenish white.

Also in S. India.

The greater number of specimens of C. P. 226 in Herb. Peraden. are *H. cubitalis.*

16. **H. Gardneri,** *Hk. f. in Fl. B. Ind.* vi. 158 (1890).

Peristylus aristatus, Thw. Enum. 310 (in part). C. P. 2373.

Fl. B. Ind. vi. 158.

Stem with spike 1–2 ft., rather slender, leafy chiefly about the middle, and with a few leafy sheaths above; tubers

cylindric; l. 2–3 by $1\frac{1}{2}$–2 in., spreading or suberect, oblong-lanceolate, acute or acuminate, coriaceous, strongly 7-veined, base sheathing; spike 6–14 in., rather stout; bracts as long as the erect hardly beaked ov., lower $\frac{1}{2}$ in. long, ovate-lanceolate, acuminate; sep. and pet. $\frac{1}{6}$–$\frac{1}{4}$ in. long, subequal in length, obtuse, 1-veined, dorsal sep. oblong, lateral linear-oblong, subfalcate; pet. larger, broadly oblong, tip rounded; lip longer than the sep., thick, clawed, claw concave, limb 3-partite, lateral segm. subulate or filiform, spreading and recurved, median shorter, straight, slender, or short and spathulate, spur as long as the sep. or longer, incurved, globose, contracted into a long or short pedicel; anth. small, cells parallel, tubes 0, pollinia pyriform, grains large, caudicles and glands obscure; rostellum erect, truncate, plicate, toothed, concealing the glands of the pollinia; fr. $\frac{1}{2}$ in., erect, fusiform, very shortly pedicelled.

Var. **latifolia.**

Stem 3–4 ft., very robust; l. 4–5 by 2–$2\frac{1}{2}$ in., oval, acuminate, very coriaceous, many-veined, base sheathing, fl. larger.

Montane zone above 4000 ft.; rather rare (?). Adam's Peak; Horton Plains. Var. β, Hantane; N. Eliya. Fl. Feb. and Sept.; green.
Endemic.

17. **H. cubitalis,** *Br. Prodr.* 312 (1810).
Herm. Mus. 23. Fl. Zeyl. n. 320. *Orchis cubitalis*, L. Sp. Pl. 940; Moon, Cat. 59. *Platanthera cubitalis*, Lindl. Gen. and Sp. Orch. 292; Thw. Enum. 310. C. P. 3202 (226 part).
Fl. B. Ind. vi. 157.

Stem with spike 1–3 ft., slender, leafy below and upwards; tubers small, oblong; l. 2–6 in., sessile, linear-oblong or -lanceolate, acute, flat, veins obscure, coriaceous; spike 8–12 in., narrow, many-fld.; bracts $\frac{1}{6}$–$\frac{1}{4}$ in., ovate-lanceolate, as long as the decurved ov. or shorter; fl. minute, rather fleshy, sep. and pet. $\frac{1}{10}$ in., obtuse, all with a diffuse thickened midrib, ending often in a dorsal swelling below the tip, dorsal sep. linear-oblong, obscurely 3-veined, lateral broadly obliquely ovate; pet. oblong, obtuse; lip about as long as the sep., fleshy, claw short, with 3 lobules at the mouth of the spur furthest from the column, limb 3-lobed, lobes short, thick, spreading and recurved, median shortest, spur as long as the sep., cylindric, incurved; anth. minute, cells parallel, tubes 0, pollinia shortly pyriform, subsessile on the glands; rostellum erect, truncate, toothed, plicate, concealing the glands of the pollinia; stigmatic processes short, clavate.

Moist low country, in paddy fields, &c.; rather common. Hewesse; Morowak Korale. Fl. March, April; sep. and pet. green, lip yellow.

Also in Khasia and Burma.

The Fl. B. Ind. has a var. *brevifolia* with very short leaves, the radical ones linear-oblong, found by Walker and Gardner.

Some allowance must be granted for probable errors in my descriptions of this and other small flowered *Habenariæ*, these having been drawn up fiom dried specimens, without the aid of good figures.—J. D. H.

59. **DISPERIS,** *Sw.*

Terrestrial, leafy, tuberous herbs ; tubers oblong, entire ; l. few, scattered, sessile, membranous ; fl. solitary or few, dorsal sep. narrow, cohering with the broad pet. into a hemispheric hood, lateral spreading or deflexed, each with a pit on the face answering to a conical protuberance on the back ; pet. semi-lunate, deflexed ; lip placed under the hood, confluent with the column to above the position of the anth. ; column short, contracted below ; anth. dorsal, oblong, 2-celled, pollinia of 2–4 series of cuneiform grains on a rhachilla, caudicles long, twisted, glands large, naked ; rostellum dilated into a hyaline membrane with 2 arms that end in twisted linear tails. —Sp. about 20 ; 2 in *Fl. B. Ind.*

D. zeylanica, *Trim. in Journ. Bot.* xxiii. 245 (1885).

D. tripetaloidea, Lindl. Gen. and Sp. Orch. 371 (part); Thw. Enum. 311. C. P. 2363.

Fl. B. Ind. vi. 169. Wight, Ic. t. 930 (from a Ceylon specimen).

Stem 6–10 in., erect, slender, few-leaved ; tuber ½–1 in. long, oblong or ovoid ; l. 1 or few, small, distant, ⅔–1 in. long, sessile, ovate, acute, base cordate-amplexicaul, very obscurely 3–5 veined from base to tip ; fl. few, subcorymbosely racemose, ½ in. broad ; bracts large, foliaceous, spreading ; ov. with very short pedicel ½ in., slender, striate ; fl. 2-lipped, upper lip composed of narrow dorsal sep. and 2 broader pet. completely connate, forming an incurved concave hood ; lower (false) lip (looking like labellum) of 2 broad lateral sepals connate at base each ½ in. long, semi-ovate, acute, slightly falcate, with a linear depression in the centre prominent beneath ; lip very small, stiffly erect under the hood, at base connate with the column and thus appearing to be at its top, bifid, with 2 long linear curved arms set with minute yellow papillæ, and with a linear appendage, which is dilated and bilobulate at the apex projecting from the sinus ; column very short, base with a 2-lipped deflexed appendage ; anth. large, 2-celled ; in front of anth. is a broad, erect, concave membrane produced at base into 2 linear flat-twisted processes ; pollinia not seen.

Among dead leaves in shady forests of lower montane zone, 3–5000 ft.; rather common. Also on summit of Ritigala N. C. Prov. at 2500 ft. Fl. April and May, September; pale dead pink, lip yellow.

Also in S. Indian Mts.

Wight's figure was made from a drawing by Mrs. Walker.

The above description of the flower, the very puzzling structure of which cannot be determined from dried specimens, is from a note by Dr. Trimen. I have to observe respecting it that, according to the rather rude figure in Wight's Icones, the "minute yellow papillae" would appear to be the pollinia, which consist of two rows of cuneiform grains secund on a rhachis with a curved caudicle and very small gland. The plant wants further study of living specimens.—J. D. H.

60. **SATYRIUM,** *Sw.*

Terrestrial herbs, with oblong tubers and erect leafy stems; l. sheathing; fl. spicate, resupinate, ov. not twisted; sep. and pet. spreading or deflexed; lip superior, sessile on the base of the column, erect, broad, hooded, with 2 dorsal reflexed spurs; column arched, terete; stigma terminal, forming a 2-lipped body with the rostellum; anth. short, cells lateral, subparallel, tubes short, pollinia 2, clavate, bipartite, granular, caudicles short, recurved, glands orbicular; staminodes hemispheric.—Sp. about 60; 1 in *Fl. B. Ind.*

S. nepalense, *Don, Prod. Fl. Nep.* 26 (1825).

Lindl. Gen. and Sp. Pl. 340, and in Journ. Linn. Soc. iii. 44. Thw. Enum. 308. C. P. 227.

Fl. B. Ind. vi. 168. Wight, Ic. t. 929. Bot. Mag. t. 6625. Ann. Bot. Gard. Calcutt. viii. t. 444.

Stem with the spike 6–18 in., stout, leafy below, many-sheathed above; tubers oblong; l. 4–10 by 2–4 in., oblong to linear-oblong or ovate-lanceolate, acute, rather thick, base sheathing, very strongly many-ribbed beneath; spike 1–6 in., dense- or lax fld.; bracts much longer than the fl., oblong or lanceolate, erect, spreading, or at length recurved; ov. $\frac{1}{3}$ in. long, turgid; fl. about $\frac{1}{3}$ in. broad; sep. small, decurved, dorsal linear-oblong, obtuse, lateral much longer, ovate-oblong, obtuse; pet. much smaller than the dorsal sep., oblong, obtuse, recurved; lip hemispheric, with reflected margins, dorsally obtusely keeled, and bearing 2 parallel spurs that are deflected along the ov.; column contracted and terete towards the base; anth. large, pollinia clavate, grains large, caudicles short, slender, glands large, rostellum broad, confluent with the broad concave stigma; fr. fusiform, erect.

In grass on patana land, montane zone above 4000 ft.; very common Fl. Sept.–January; bright rose-pink, rarely paler or white, very sweet-scented.

Hills of S. India, Himalaya, Khasia.

A very charming little ground-orchid, usually termed the 'Hyacinth orchis' by the English.

61. **APOSTASIA,** *Bl.*

Terrestrial, perennial, leafy herbs, with a short rootstock and fibrous roots; l. narrow, strongly veined; fl. small, in terminal panicled spikes; sep. pet. and lip. all equal and similar, free, spreading and recurved; ov. very slender, 3-celled, ovules many, on axile placentas; column short, erect; anth. 2, on the sides of the column, opp. the pet., shortly stipitate, versatile, cells 2, parallel, opening inwards; pollen grains free, dry, ellipsoid; style slender, stigma simple, terminal; fr. narrow, linear, trigonous; seeds minute, ellipsoid, testa black, reticulate.—Sp. 6; 3 in *Fl. B. Ind.*

A. Wallichii, *Br. in Wall. Cat.* 4448 (1828).

Thw. Enum. 315. C. P. 2744.

Fl. B. Ind. vi. 175. Wall. Pl. As. Rar. t. 84. Ann. Bot. Gard. Calcutt. viii. t. 444.

Stem 1–2 ft., stout, leafly throughout; l. 4–8 in., linear-lanceolate, finely acuminate, spreading and récurved, coriaceous, strongly 5–7-veined, base sheathing; panicle 4–10 in., peduncled, decurved, ped. naked, spikes 2–3 in., bracts lanceolate, acuminate; fl. subsecund, about $\frac{1}{4}$ in. broad; ov. $\frac{1}{2}$–$\frac{3}{4}$ in.; sep., pet., and lip linear-lanceolate, cuspidate, tips spreading; anth. oblong, bases of the cells unequal; staminode adnate to the style; fr. $\frac{1}{2}$–$\frac{3}{4}$ in., hispidulous.

In forests, moist low country below 2000 ft.; rare. Palabadala; near Hewesse; Dolosbagie. Fl. Nov.–Dec.; yellow.

Nepal, Assam, Malay Pen., Java, Sumatra, N. Guinea.

CXXVII.—SCITAMINEÆ.

HERBS, usually perennial; stem 0, or of convolute l.-sheaths; l. usually large, simple, pennivcined, sheaths long; infl. terminal, or on a leafless ped. from the rootstock, solitary, spicate, racemose or panicled, often of capitate or cone-like spikes; cal. superior, produced above the ovary into 3 sepals. or into a long or short tube; cor. usually tubular, with a spreading 3-partite limb (a single short, membranous pet. in *Musa*); stam:—in *Zingibereæ* one perfect, with a 2-celled

anth., and one or more petaloid; in *Maranteæ* and *Canneæ*, one perfect, with a 1-celled anth., and 3 or 4 petaloid forming an inner corolla;—in *Musa* 5 perfect, with 2-celled anths.; ov. inferior, 1–3-celled, ovules few or many, style usually long, slender, with 2 small epigynous stylodes at its base, stigma capitate, cupular or clavate, mouth usually ciliate; fr. various, dehiscent or not, endosperm floury, embryo small.

Stam. 1.
- Cal. tubular, funnel-shaped, or spathiform, anth. 2-celled (*Zingibereæ*).
  - Ov. 1-celled, placentas 3, parietal . . 1. GLOBBA.
  - Ov. 3-celled, placentas axile.
    - Lateral staminodes broad.
      - Anth.-cells spurred at the base . 2. CURCUMA.
      - Anth.-cells not spurred at the base.
        - Connective broad, crested . . 3. KÆMPFERIA.
        - Connective narrow, not crested . 4. HEDYCHIUM.
    - Lateral staminodes small or 0.
      - Infl. terminal on the leafing stem.
        - Infl. spicate or capitate.
          - Anth. adnate to the petaloid fil. 5. COSTUS.
          - Anth. free . . . . . 7. AMOMUM RUFESCENS.
        - Infl. panicled or racemose . . 6. ALPINIA.
      - Infl. on a radical leafless ped.
        - Flg. stem simple.
          - Anth. with a very broad crest or 0 . . . . . . 7. AMOMUM.
          - Anth. with an elongate terminal spur . . . 8. ZINGIBER.
        - Flg. stem branched.
          - Anth. crested . . . . 9. CYPHOSTIGMA.
          - Anth. not crested . . . 10. ELETTERIA.
- Cal. of 3 sep.; anth. 1-celled.
  - Staminodes 3, petaloid, connate (*Maranteæ*).
    - Stem branched, leafy . . . . . 11. CLINOGYNE.
    - Leaf solitary . . . . 12. PHRYNIUM.
  - Staminodes 4 (*Canneæ*) . . . . . 13. CANNA.

Stam. 5 (*Museæ*) . . . . 14. MUSA.

1. **GLOBBA,** *Linn.*

Tufted, erect, herbs, with a short creeping rootstock; l. oblong or lanceolate; fl. in a terminal raceme or spike, buds often replaced by bulbils; cal.-tube funnel-shaped, 3-lobed; cor.-tube longer than the cal., lobes subequal, ovate; lateral staminodes petaloid, contiguous to the corolla-lobes; stam. 1, fil. incurved, anth. 2-celled, oblong, cells parallel, connective laterally winged, not crested; ov. 1-celled, placentas 3, parietal, style filiform, upper part placed in a groove in the

fil., stigma turbinate; fr. globose or oblong, at length dehiscent; seeds small, ovoid, aril small, lacerate, white.—Sp. about 30, 27 in *Fl. B. Ind.*

G. bulbifera, *Roxb. in Asiat. Res.* xi. 358 (1810).
Thw. Enum. 315. *G. marantinoides*, Trim. Cat. Ceyl. 91. C. P. 3563.
Fl. B. Ind. vi. 206. Wight, Ic. t. 2001 (*G. marantina*).

Stems 2–2½ ft., slender, crowded on a tufted rootstock, erect or somewhat drooping; root of fleshy fibres; l. 5–7 in., by 1¼–1¾ in., few, distichous, shortly petioled, oval to oblong-lanceolate, acuminate, midrib stout, green, paler beneath, sheath long, ligule very short, ciliate; spike or raceme 2–3 in., bracts loose, broadly oval-oblong, lower 1 in., obtuse or subacute, spreading or somewhat deflexed, green, persistent; fl. very shortly pedicelled, lower in the spike replaced by ovoid yellow bulbils $\frac{1}{6}$–$\frac{1}{4}$ in. diam.; cal.-tube short, cylindric, obscurely 3-lobed; cor.-tube very slender, $\frac{1}{3}$ in. long, segm. subequal, oblong, shorter than the tube; lip deeply bifid, deflexed; fil. long, slender, incurved, anth.-cells narrow, winged on both sides, wings spreading, deeply 2-fid; fr. $\frac{1}{4}$ in. long, oblong, terete, smooth.

Shady places in the dry country; rather rare. Near Batticaloa; near Nilgala. Fl. Jan., Feb., June; lemon-yellow.

Also India and Malaya.

2. CURCUMA, *Linn.*

Rootstock bearing simple and tuberiferous root-fibres; stem various; l. oblong; infl. terminal on the leafing stem, or on a distinct ped., spicate, spike large, of concave or saccate persistent, col'd, many-fld. bracts, the upper of which are often elongate, empty, forming a crown to the spike; fl. bracteolate, subsessile; cal. tubular; cor.-tube funnel-shaped, limb 3-partite, dorsal segm. longer and more concave; lateral staminodes oblong, petaloid; lip broad, recurved; fil. short, adnate to the lateral staminodes, anth. not crested, bases of cells spurred, incurved; ov. 3-celled, many-ovuled, style filiform, stigma 2-lipped, lips ciliate; fr. globose, pericarp membranous, at length 3-valved; seeds ovoid or oblong, arilled or not.—Sp. many; 30 in *Fl. B. Ind.*

Spike on a leafless ped.
  Spike many-fld.
    L. pubescent beneath . . . . 1. C. AROMATICA.
    L. glabrous beneath . . . . 2. C. ZEDOARIA.
  Spike few-fld. . . . . 3. C. OLIGANTHA.
Spike terminating the leafy stem . . . . . 4. C. ALBIFLORA.

1. **C. aromatica,** *Salisb. Parad. Lond.* t. 96 (1808). **Dadakaha, Walkaha,** *S.*

C. Zedoaria, Roxb. (non Rosc.), Moon, Cat. 2. Thw. Enum. 316. C. P. 3705.

Fl. B. Ind. vi. 210. Wight, Ic. t. 2005. Bot. Mag. t. 1546 (*C. Zedoaria*)

Rootstock large, of palmately branched sessile, annulate, biennial tubers, yellow and aromatic within; l. 18–24 in., oblong, caudate-acuminate, base deltoid, green, often variegated above, pubescent beneath, petiole 2–3 ft., green; flg. stem appearing before or with the leafing stem, as thick as the fore finger, sheathed; spike 6–12 in., about 1 in. diam.; fl. bracts 1½–2 in., recurved, ovate, cymbiform, tip rounded, pale green, connate below forming pouches for the fl.; empty bracts 2–3 in., red or pink; fl. shorter than the bracts; cor.-tube 1 in., upper-half funnel-shaped, lateral segm. oblong, upper longer, ovate, concave, over-arching the anth.; staminodes obtuse, as long as the cor.-segm.; lip deflexed, orbicular, obscurely 3-lobed.

Damp shady places in low country; rather rare. Pusselawe; Gampola; but often cultivated. Fl. Jan., Feb.; cor. pinkish-white, lip yellow, fragrant.

Throughout India.

Rootstock used medicinally.

2. *__C. Zedoaria,__ *Roscoe, Scit. Pl.* t. 109 (1828). **Harankaha,** *S.*

C. Zerumbet, Roxb.; Thw. Enum. 316. *C. longa,* Moon, Cat. 2 (non L.). C. P. 3373.

Fl. B. Ind. vi. 210. Roxb. Pl. Corom. t. 101 (*C. Zerumbet*). Rheede, Hort. Mal. xi. t. 7.

Rootstock very stout, with many sessile, cylindric, oblong, and palmately branched annulate tubers, pale yellow or white inside, with a camphoraceous smell and bitterish spicy taste, also bearing long fleshy fibres that terminate in smaller oblong less fragrant tubers; l. 4–6, sub-bifarious, 1–2 ft. long, oblong-lanceolate, finely acuminate, glabrous on both surfaces, clouded with purple down the middle, petiole long, narrowly winged; flg. stem 8–10 in., appearing before the l., stout, clothed with obtuse sheaths; spike 4–5 in., 3 in. diam., fl. bracts 1½ in., ovate, recurved, cymbiform, green tinged with red, empty bracts 2 in. long, crimson or purple; cal. obtusely toothed; cor.-tube twice as long, funnel-shaped, lateral segm. oblong, upper longer, vaulted, overarching the anth.; staminodes short, broadly oblong; lip ½ in. broad, orbicular, deflexed, obscurely 3-lobed; fil. short; fr. ovoid, trigonous, thin, smooth, bursting irregularly; seeds oblong, aril lacerate, white.

* Zedoar is the Arabic jadwār, and zerumbet the Persian zarambād.

Damp shady places about villages in the moist low country, generally if not always cultivated. Fl. Jan.–March; pale yellow.

Also India and Malay Archipelago.

The rootstock possesses aromatic, stimulant, and carminative properties, and is used as a stomachic. It is also an important article of perfumery.

C. longa, Linn. *Kaha*, S. *Manchal*, T., the Turmeric plant, is much grown in native gardens, and a good figure is given by Hermann (Hort. Lugd.-Bat. t. 209). It is No. 7 of Fl. Zeyl., but certainly not a native here.

3. **C. oligantha,** *Trim. in Journ. Bot.* xxiii. 245 (1885). [PLATE XCII.]

C. P. 3700.

Fl. B. Ind. vi. 215.

Tubers ovoid, oblong or elongate, 1 in. long or more, sessile at the thickened base of the short stem, red-brown; l. 4–5 in., ovate-oblong or lanceolate, acute or acuminate, undulate, thin, base acute, rounded or cordate, pale-green mottled with darker, petiole 3–5 in., very slender; flg. stem 2–3 in., slender, produced before the l., basal sheaths narrow, red-brown, upper shorter, very pale; spike 4–6 in., narrow, erect, few-fld.; bracts 4–6, about 1 in. long, oblong, acute, white or greenish, all flg., or a few empty; cal.-tube ½ in., inflated, membranous; cor.-tube 1–1½ in., very slender, segm. lanceolate, acuminate; staminodes ⅔ in., erect, broady oblong, undulate, margins recurved; lip as long as the staminodes, very broad, decurved, 2-lobed, undulate; anth. small, broadly oblong; fr. about ½ in., oblong, smooth; seeds oblong, grey, shining, aril 0.

Dry stony places in the dry region; rather common. Anuradhapura or Puttalam (M. Brodie); foot of Gunner's Quoin (H. Nevill); near Pankulam, E. Prov.; below Lagalla. Fl. Aug.–October; white, with yellow stains in the throat.

Endemic.

4. **C. albiflora,** *Thw. Enum.* 316 (1861).

C. P. 2737.

Fl. B. Ind. vi. 215. Bot. Mag. t. 5909.

Rootstock bearing a few small tubers at the ends of the root fibres, sessile tubers 0; l. 6–8 by 2½–3 in., oblong, acute or acuminate, base rounded or cordate, bright green, quite glabrous, petiole as long as the blade or longer, stout or slender, deeply channelled above, dilating into a long, compressed, green sheath, with membranous margins; flg. stem lateral from the base of the leafing stem, very short, enclosed in the l. sheaths, and bearing one or two green sheaths; spike 3–5 in., oblong; bracts all flg., all green or crossed with darker transverse bands, lower 2 in. long, oblong-lanceolate, tip

rounded or cuspidate, upper much shorter, oblong, obtuse; fl. ½–¾ in. across the mouth; cal. about half the length of the cor.-tube, narrowly funnel-shaped, obliquely bifid; cor.-tube 1 in., subcampanulate, segm. oblong, obtuse, erect, dorsal broader; staminodes broad, obtuse; lip suborbicular, broader than long, emarginate or bifid, reflexed, sides incurved, disk with a golden band.

Moist region; very rare. Ambagamuwa Dist. Fl. Feb.–June; white, with yellow stain on lip.

Endemic.

3. **KÆMPFERIA,** *Linn.*

Rootstock short; stem short or 0; l. few; spike terminating the leafing stem, or on a radical leafless stem; cal.-tube short, cylindric, bifid or split down one side; cor.-tube long, slender, segm. equal, spreading; staminodes broad, petaloid, lateral erect; lip decurved; anth. erect, opp. the lip, cells linear, on the margins of the broad connective, which is produced into an entire or bifid appendage; ov. 3-celled, cells few- or many-ovuled, style long, filiform, stigma globose or turbinate, mouth ciliate; fr. ovoid or oblong, pericarp thin; seeds subglobose, aril lacerate.—Sp. about 30; 22 in *Fl. B. Ind.*

Lip obovate-panduriform . . . . 1. K. PANDURATA.
Lip very broad, 2-lobed . . . . 2. K. ROTUNDA.

***K. pandurata,** *Roxb. in Asiat. Res.* xi. 328 (1810). **Ambakaha,** *S.*

Thw. Enum. 316. *Zingiber xanthorhiza*, Moon, Cat. 1. C. P. 3702. Fl. B. Ind. vi. 220. Bot. Reg. t. 173. Rumph. Herb. Amb. v. t. 69, f. 1.

Rootstock horizontal, bright yellow within, with many nodose branches and thick succulent vermiform root-fibres; l. few, distichous, erect, 9–15 in. long, oval, acute, decurrent into the wings of the long, stout, much sheathing petiole, which attains 6 in., and is deeply channelled above, green on both surfaces, midrib stout, ligule short, narrow; spike terminal, subsessile amongst the leaves, 3–4 in. long, oblong, dense-fld.; bracts about 2 in. long, linear-lanceolate, subacute, hyaline, inner narrower; cal.-tube about 1 in. long, cylindric, narrow, hyaline, bifid; cor.-tube over 2 in., very slender, cylindric, erect, or curved at the top, segm. about ¾ in., oblong, acute; staminodes 3, 2 lateral equal, ½ in., oval-oblong, obtuse, spreading; lip ¾ in. broad, broadly oval-panduriform, undulate; anth. erect, recurved, tipped with a bifid appendage.—*Trimen* MSS.

In native gardens, never I think really wild. Fl. May; pale pink, the lateral staminodes darker, the lip mottled with purple.

Also in Western India, Burma, and Malaya.

The rhizome has a warm, slightly aromatic flavour, used in medicine only. The 'Mango-Ginger' of India is a different plant (*Curcuma Amada*, Roxb.).

K. Galanga, Linn., *Hingum-pujali*, S., is largely cultivated in native gardens. Hermann mentions it (Mus. 54), Burm. gives a wretched figure (Thes. t. 13, f. 1), and it is Fl. Zeyl. n. 8. There is a good figure in Wight, Ic. t. 899.

2. ***K. rotunda**, *Linn. Sp. Pl.* 2 (1753). **Yawakenda, Lankenda,** *S.*

Burm. Thes. 67. Fl. Zeyl. n. 9. Moon, Cat. 2. Thw. Enum. 316. C. P. 3175.

Fl. B. Ind. vi. 222. Wight, Ic. t. 2029. Bot. Mag. t. 6054.

Rootstock tuberous, with many very thick fascicled succulent root-fibres, bearing oblong tubers 1–2 in. long; l. few, erect, 12 by 3–4 in., oblong, acuminate, mottled green above, beneath pale red-purple, base contracted into a long cylindric purple-brown sheath; spike produced before the l., oblong, sessile, 4–6-fld., clothed with large purple imbricating bracts; fl. very large, 2 in. broad; bracts oblong, acute, inner 2–3 in. long, outer shorter; cal. tubular, nearly as long as the cor.-tube, minutely toothed, spathaceous, slit on one side; cor.-tube 2–3 in., segm. 2–2½ in., narrowly linear-lanceolate, acuminate, widely spreading, margins involute; lateral staminodes 1½–2 in. long, erect, oblong, obtuse; lip deflexed, deeply cleft into 2 suborbicular coloured lobes as long as the staminodes and broader; anth. erect, crest divided to the base into 2 erect lanceolate or subulate segments.

Low country, not uncommon, but nowhere wild; abundant in Peradeniya Gardens. There are specimens from Moon in Brit. Mus. from Three Korales collected in 1820. Fl. March, April; petals and staminodes white, lip with darker green, bright violet-purple.

A very handsome plant; fl. sweet-scented, l. often clouded in the middle, and with paler green between the veins.

4. HEDYCHIUM, *Kœn.*

Rootstock horizontal, stout, root-fibres not tuberous; stem elongate, leafy; l. distichous, oblong or lanceolate; fl. few or many, in terminal bracteate spikes; bracts oblong, coriaceous, 1 or more-fld.; cal. tubular, 3-toothed; lateral staminodes linear or cuneately oblong; lip large, 2-fid; fil. narrow, usually very long, anth.-cells contiguous, connective not produced; ov. 3-celled, ovules many, superposed, style long, filiform, stigma subglobose; capsule globose or oblong, 3-valved; seeds many, aril lacerate.—Sp. 35; 24 in *Fl. B. Ind.*

Stam. about as long as the lip.
  L. pubescent beneath, fl. white . . . . . 1. H. CORONARIUM.
  L. glabrous beneath, fl. yellowish . . . . 2. H. FLAVESCENS.
Stam. twice as long as the lip or more . . . 3. H. COCCINEUM.

1. **H. coronarium,** *Kœn. in Retz. Obs.* iii. 73 (1783). **Elamal,** *S.*

Moon, Cat. 1. Thw. Enum. 319. C. P. 3018.
Fl. B. Ind. vi. 225. Wight, Ic. t. 2010. Bot. Mag. t. 708.

Rootstock stout, horizontal, ½–2 in. diam., fleshy, jointed; stem 3–4 ft., erect, leafy; l. 9–12 by 2 in., lanceolate, finely acuminate, glabrous or sparsely pubescent along the midrib beneath, sheath smooth, ligule long, membranous; spike 3–6 in. long, oblong; bracts closely imbricate, 3–4-fld., oblong, tips rounded, outer 1½–2 in., coriaceous, brown in age, bracteoles 3, membranous; cal. 1–1½ in., cylindric, green, shorter than the bracts; cor.-tube 3 in., segm. linear, half as long as the tube, reflexed; lateral staminodes 1½–2 in., oblong or oblong-lanceolate; lip 1½–2 in. broad, suddenly constricted into a short claw, entire or 2-fid, lobes rounded; stam. 1¾ in., as long or rather longer than the lip, anth. about ½ in. long; fr. oblong, glabrous, valves orange-yellow within; seeds many, with a crimson aril.

Moist region by streams to about 4000 ft.; common. Fl. Aug., Sept.; fragrant, pure white, with a tinge of green in upper staminode.
Throughout India and Malaya.

2. **H. flavescens,** *Carey in Rosc. Scitam. Pl.* t. 50 (1825).

H. coronarium, Kœn. var., Wall. in Kew Journ. Bot. v. 325; Thw. Enum. 319; Trim. Syst. Cat. 91. C. P. 3728.
Fl. B. Ind. vi. 226 (under *H. coronarium*). Wight, Ic. tt. 2008–9. Bot. Mag. t. 2378 (*H. flavum*).

Rootstock stout, horizontal, 2–3 in. diam., jointed; stem 6–8 ft., stout, leafy; l. 2 ft., linear-lanceolate, caudate-acuminate, glabrous above, appressed silky beneath, with easily detached hairs, sheaths long, quite glabrous; ligule 1¾ in., thin, obtuse; spike 4–5 in.; bracts 2½ in., thick, convolute, very obtuse, slightly hairy, margins ciliate, membranous; fl. numerous, in clusters of 3–4 opening consecutively, sessile, bracteoles large, membranous; cal.-tube 1½ in., narrow, split half way down, membranous, slightly silky and ciliate; cor.-tube over 3 in., very slender, at first straight then curved, segm. 1¼–1½ in., linear, acute, membranous; lateral staminodes 2 in., erect, oblong-spathulate, emarginate or bilobed, lip broadly obcordate, bilobed, narrowed into a short claw; fil. 1½ in., stout, erect, anth. ⅝ in.; ov. silkily hairy.—Chiefly *Trimen MSS.*

By streams in moist region up to 6000 ft.; rather common, especially in the hills. Fl. Aug., Sept.; yellowish-cream-coloured, sweet-scented.

Bengal, Khasia, Nilghiri Hills, &c.

Doubtful if distinct from *H. coronarium*, which is a smaller and more slender species, with smaller l., glabrous beneath, narrower fewer-fld. spikes, more slender lateral staminodes, and pure white fl.

3. **H. coccineum,** *Ham. in Rees Cyclop.* xvii. 5 (1819).
H. angustifolium, Wall., Thw. Enum. 319. C. P. 3669.
Fl. B. Ind. v. 231. Bot. Mag. t. 2078 (*H. angustifolium*).

Rootstock stout, horizontal, jointed, stoloniferous; stem 4–8 ft., compressed, densely leafy; l. 14–18 in., close set, linear-lanceolate, acuminate, tip setaceous, glabrous, except the midrib beneath, dark green, base obtuse or rounded, sheath short, ligule about $\frac{1}{2}$ in., rounded, membranous; spike 4–8 in., subsessile, strict, rigid; bracts 6-ranked, oblong, 2–4-fld., tips rounded; bracteoles membranous; cal. cylindric, about as long as the bracts and cor.-tube, mouth equally 3-toothed; cor. tube nearly 1 in., cylindric, segm. as long as the tube, narrowly linear, reflexed; lateral staminodes 1 in., cuneate-oblong, subacute, spreading; lip long-clawed, about 1 in. broad, orbicular, deeply bifid, lobes obtuse; fil. $1\frac{1}{2}$–2 in., anth. linear; stigma funnel-shaped.—Partly from *Trimen MSS.*

Open shrubby places in moist region up to 5000 ft.; rather common. Fl. Feb., July; bright red-pink or salmon-red.

Also in E. Himalaya and Burma.

A widely spread and variable species, of which the Ceylon form is not exactly that of any of the 5 vars. given in Fl. Brit. Ind. Baker refers it to var. *H. squarrosum*, Harv., but it agrees better with var. *H. angustifolium*, Roxb. (Bot. Mag. t. 2078).

5. COSTUS, *Linn.*

Rootstock tuberous; stem tall, stout, leafy; l. oblong, spirally arranged, sheath broad; spike terminal, dense-fld., bracts large; cal.-tube short, infundibular, teeth ovate; cor.-tube not longer than the cal., segm. 3, large, subequal, oblong; lateral staminodes 0, or minute; lip large, ovate or sub-orbicular, margins incurved; fil. confluent with the connective in an oblong petaloid limb, anth.-cells in the centre of the limb, linear, parallel; ov. 3-celled, cells many-ovuled, style filiform, stigma clavate, mouth semilunar, ciliate; fr. coriaceous, dehiscent; seeds many, arilled.—Sp. 25; 3 in *Fl. B. Ind.*

C. speciosus, *Smith in Trans. Linn. Soc.* i. 249 (1791). **Tébu,** *S.* Moon, Cat. 2. Thw. Enum. 320. C. P. 3082.
Fl. B. Ind. vi. 249. Wight, Ic. t. 2014. Rheede, Hort. Mal. xi. t. 8.

Rootstock stout, tuberous, insipid; stem 6–9 ft., stout, erect; l. 6–12 in. or more, sessile, oblong, acute, acuminate, or

cuspidate, silky beneath, sheath coriaceous, ligule 0; spike sessile, many-fld., 2–4 in. diam.; bracts 1–1½ in., ovate, acuminate, bright red, as long as the cor.-tube; cal.-tube 1 in. long, lobes 3, ovate, cuspidate; cor.-tube as long as the calyx, segm. longer than the tube, acute; lip suborbicular, 2–3 in. diam., concave, plicate, and crisped, margins sometimes meeting in the middle, disk pubescent, and with a tuft of hairs at the base; stam. 1½–2 in., linear, with a tuft of hairs at the base of the fil., connective petaloid, pubescent on the sides, produced into a recurved, lanceolate, glabrous appendage as long as the linear cells; ov. subglobose, pubescent; fr. globosely trigonous, red, 1 in. diam.

Shady places in low country; rather rare. Ambagamuwa; Morowak Korale; Kaduganawa; Nilgala. Fl. Jan.–March, June; lip white, with yellow centre.

Throughout India and Malaya. Rootstock used medicinally, and eaten in famine times.

6. **ALPINIA,** *Linn.*

Rootstock stout; stem tall, stout, simple, leafy; l. oblong or lanceolate; fl. in terminal panicles or racemes, bracteate and bracteolate; cal. loosely tubular or subcampanulate, mouth shortly 2–3-toothed or -lobed; cor.-tube cylindric, about as long as the cal., lobes spreading, dorsal broader and more convex; lateral staminodes small; lip large, spreading, sessile or clawed; fil. broad, concave, anth.-cells linear, separated by a broad or narrow connective; ov. 3-celled, style filiform, stigma subglobose; fr. globose, many-seeded; seeds with a fleshy or spongy aril.—Sp. about 40; 17 in *Fl. B. Ind.*

Panicle broad, erect or inclined; lip long-clawed . 1. A. ALLUGHAS.
Panicle narrow, drooping; lip sessile . . . . 2. A. NUTANS.

1. **A. Allughas,** *Rosc. in Trans. Linn. Soc.* viii. 346 (1807). **Alu, Alu-gas, Alan, Kelenuja,** *S.*

Herm. Mus. 46. Burm. Thes. 54. Fl. Zeyl. n. 448. *Heritiera Allughas*, Retz. Obs. Bot. vi. 17. *Zingiber nigrum*, Gaertn. Fruct. i. 35. Moon, Cat. 1. Thw. Enum. 320. C. P. 3157.

Fl. B. Ind. vi. 253. Retz. Obs. Bot. vi. t. 1. Wight, Ic. t. 2026 (*A. Rheedii*).

Root tuberous, aromatic; stem. 3–6 ft.; l. very shortly petioled, 1–1½ ft. by 3–6 in., linear-oblong or oblong-lanceolate, acuminate, with usually a twisted cusp, glabrous, base acute, sheath compressed, ligule rounded; panicle erect, decompound, 6–12 in. long, pubescent or tomentose, lax- or dense-fld., branches short, ascending, with linear deciduous bracts 4–6 in. long at the lower forks; fl. suberect, shortly pedicelled,

1–1½ in. long; bracts small, cupular; cal.-tube ⅓–½ in., subcampanulate, pubescent, mouth oblique, obtusely 2–3-toothed; cor.-tube as long as the cal., segm. longer than the tube, linear-oblong, cymbiform, dorsally pubescent, shortly spurred below the hooded tip; lip 1 in. long, including the slender claw, cuneiform or nearly orbicular, bifid, margins waved and erose, claw as long as the limb, base with 2 fleshy teeth; fil. nearly as long as the anth., cells distant, glabrous, connective produced into a small lobed crest; style glabrous, stigma small; fr. globose, ⅔ in. diam., pericarp black, fragile; seeds small, black.

In wet places in the low country; rather common. Fl. Jan.–March; pink.

All India and Malaya, wild or cultivated.

There being no specimens in Herb. Hermann Linnæus left this unnamed. Kœnig's specimens, on which Retzius founded the species, are in Brit. Mus.

Rootstock used as a medicine.

2. **A. nutans,** *Roscoe in Trans. Linn. Soc.* viii. 346 (1807), var. **sericea,** *Moon, Cat.* 1 (sp.). **Ran-kiriya,** *S.*

Thw. Enum. 320. C. P. 3312.

Fl. B. Ind. vi. 256. Bot. Mag. t. 1093. Wight, Ic. t. 2027.

Rootstock tuberous; stem 8–10 ft., leafy; l. bifarious, subsessile or petioled, 1–2 ft. by 3–6 in., linear-oblong, cuspidately acuminate, glabrous, smooth, shining, base acute or obtuse, petiole up to 2 in., sheath smooth, ligule oblong, coriaceous, hairy; panicle narrow, racemiform, inclined or decurved, villous, rhachis very stout, 1 ft. long; branches short, simple, terminated by very shortly pedicelled bracteate fls.; bracts 1½ in. long, cymbiform, enveloping the buds, often bifid, deciduous; cal.-tube 1 in. long, campanulate, inflated, broadly 3-lobed, lobes acute; cor.-tube shorter than the cal., dorsal segm. much largest, ovate-oblong, entire or obscurely 3-lobed, lateral linear-oblong, tips rounded; lip large, 1½ in. long, sessile, broadly ovate-cordate, obtuse or 2-fid, sides incurved, margins crisped, base with 2 short spurs embracing the base of the style; fil. short, anth.-cells glabrous, connective not produced beyond the cells; style hairy; fr. globose, ¾ in. diam., pedicelled, tomentose; seeds angular.

Low country; very rare. In a forest between Negombo and Kurunegala (Thwaites). Fl. June; white, the lip yellow, veined and speckled with vinous red.

Our variety endemic; the type is Malayan and common in Ceylon Gardens; has larger fl., bracts tipped with red, and a longer infl. —*Trimen.*

A very common and variable plant. The Ceylon form seems to me hardly to constitute a marked variety.—J. D. H.

A. Galanga, Sw., *Kaluwala*, S., is very commonly cultivated, but not, I think, anywhere wild. It is recorded by Hermann (Mus. 51), and there is a good figure by him in Mus. Brit. which is *Costus arabicus*, L., as far as Fl. Zeyl. n. 5 is concerned. It may he known by the large bracts, sessile white lip veined with lilac, and the orange-red fr. the size of a cherry.

A. calcarata, Rosc. is given from Ceylon in Fl. B. Ind., but I have never seen it out of gardens. Figured in Wight, Ic. t. 2028. It is *Katakiriya*, S., and C. P. 3730. The lip is sessile, variegated with red and yellow, the bracts small.

7. AMOMUM, *Linn.*

Rootstock elongate; leafing stem elongate, distinct from the flg., except in *A. rufescens;* l. oblong or lanceolate; infl. spicate or subcapitate; bracts large, imbricate, few- or many-fld.; fl. bracteolate; cal. tubular or funnel-shaped upwards, 3-toothed or 2-lobed, or split down one side; cor.-tube cylindric, usually very slender, segm. oblong or linear, dorsal usually largest; lateral staminodes of minute teeth or 0, lip petaloid or fleshy, recurved; anth. free, cells parallel or diverging upwards, bases obtuse, connective sometimes produced beyond the cells in a short or broad crest; ov. 3-celled, cells many-ovuled, style slender, not produced beyond the anth., stigma various, mouth ciliate; fr. dehiscing irregularly, seeds many, arillate.—Sp. about 150; 48 in *Fl. B. Ind.*

Fl. spikes on leafless stems from the rootstock.
  Anth. not crested, or crest very short.
    Fl. stems long.
      Lip obscurely lobed or entire . . . 1. A. FLORIBUNDUM.
      Lip strongly 3-lobed . . . . . 2. A. INVOLUCRATUM.
    Fl. stems short . . . . 3. A. NEMORALE.
  Anth. crested, crest broader than long.
    Anth.-crest entire or crenate.
      Spike globose or oblong, many-fld.
        L. glabrous beneath.
          Anth.-cells hairy.
            L. 5–6 in. long . . . . . 4. A. ACUMINATUM.
            L. 1–2 ft. long . . . . . 5. A. FULVICEPS.
          Anth.-cells glabrous.
            Anth.-crest semilunar . . . . 6. A. MASTICATORIUM.
            Anth.-crest orbicular . . . . 7. A. GRAMINIFOLIUM.
        L. pubescent beneath . . . . . 8. A. CILIATUM.
      Spike few-fld. . . . . 9. A. HYPOLEUCUM.
    Anth.-crest, 3-lobed.
        L. 1–2 ft.
          Fr. ribbed . . . . . . 10. A. PTEROCARPUM.
          Fr. echinate . . . . . . 11. A. ECHINATUM.
        L. 6–8 in., fr. echinate . . . . 12. A. BENTHAMIANUM.
Spike terminating the leafy stem . . . . 13. A. RUFESCENS.

1. **A. floribundum,** *Trim. Syst. Cat.* 92 (1885).
Elettaria floribunda, Thw. Enum. 319. C. P. 3374.
Fl. B. Ind. vi. 233.

Leafing stem 3–6 ft. or more; l. 18–24 by 3–5 in., oblong or linear-lanceolate, acuminate, glabrous on both surfaces or pubescent on the midrib beneath, firm, base narrowed into a petiole ½–1 in. long, sheath glabrous, ligule short, rounded, entire, coriaceous; flg. stem 1–1½ ft., very stout, ½ in. diam. clothed with erect, obtuse, brown, smooth sheaths; spike globose, truncate, many-fld., 3–4 in. diam.; bracts blood-red, very broad, outer 1½ in. long and broad, retuse rounded or mucronate; fl. shorter than the bracts, about 1½ in. long; cal.-tube ventricose, about as long as the cor.-tube, split; cor.-tube ½–¾ in., segm. subequal, ¼–⅓ in. long, broadly oblong, obtuse, concave; lateral staminodes 0; lip spathulate, subacute, fleshy, about as long as the cor.-segm., tip recurved; anth. ⅕ in., subsessile, connective dilated upwards into a very low fleshy 2-lobed crest, cells slender, diverging upwards, glabrous; ov. and style glabrous, stigma subcapitate; fr. ¾ in. long, ovoid, narrowed into the longer persistent calyx-tube, subtrigonous, coriaceous, appressed pubescent.

Forests in montane zone 3–4000 ft.; rare. Ambagamuwa; Hantane. Fl. Nov.; pale yellow, bracts crimson.

Endemic.

The description given above is taken from several flowers in the Peraden. Herb. It differs in the character of the lip from that of Thwaites, who calls this 'obovate, retuse, obscurely 3-lobed.' A fruiting specimen in Herb. Peraden. has an oblong spike 6 in. long by 4 in. diam., like that of *A. fulviceps*.—J. D. H.

2. **A. involucratum,** *Trim. Syst. Cat.* 92 (1885).
Elettaria involucrata, Thw. Enum. 319. C. P. 3019.
Fl. B. Ind. vi. 233.

Leafing stem 6–10 ft. and upwards; l. 1½–3 ft. by 4–7 in., subsessile, oblong- or linear-lanceolate, acuminate, membranous, glabrous, or finely pubescent beneath, base acute, sheath coriaceous, pubescent, ligule short, rounded, entire, pubescent; flg. stem 1½–3 ft., very stout, erect, clothed with oblong or ovate-oblong obtuse red sheaths 3–10 in. long; spike globose, spreading and truncate above, involucrate by large red bracts; outer bracts ovate-oblong, much longer than the fl., inner shorter, almost orbicular, membranous, innermost 1–1½ in., oblong, obtuse; cal.-tube nearly as long as the cor.-tube, coriaceous, glabrous, inflated above, usually dorsally cuspidate; cor.-tube ¾–1 in. long, stout, curved, glabrous, funnel-shaped above, segm. broadly ovate-oblong, or orbicular, not half the length of the tube; lip rather longer than the cor.-

segm., obovate, subequally 3-lobed, thick, margins crisped; fil. short, broad, anth. large, glabrous, cells diverging above, crest 0; ov. and style glabrous.

Forests in montane zone 4–6000 ft.; rather common. Fl. Sept.–Nov.; pale yellow, lip white, with pink stripes, cor.-segm. pinkish.
Endemic.

3. **A. nemorale,** *Trim. Syst. Cat.* 92 (1885).
Elettaria nemoralis, Thw. Enum. 319. C. P. 3703.
Fl. B. Ind. vi. 233.

Rootstock woody, creeping and rooting, root-fibres stout; leafing stem 2–4 ft.; l. 8–15 by 1½–2 in., shortly petioled, linear or oblong-lanceolate, acuminate, firm, glabrous on both surfaces, thinly coriaceous, base acute, midrib slender, petiole short, sheath long, narrow, ligule short, rounded, entire; flg. stem 2–3 in., decurved or decumbent, clothed with broad loose scales, the upper scales longer; spike short, oblong, or subglobose, 1–1½ in. diam.; bracts ½–⅔ in., orbicular or obovate, concave, membranous, floral lanceolate; fl. about ¾ in. across the limb; cal.-tube ½ the length of the cor.-tube, membranous, glabrous; cor.-tube 1½ in., very slender, segm. ⅓–½ in., subequal, oblong, obtuse; lip reniform, 3-lobed, crenate, side lobes falcately recurved, mid lobe smaller, rounded, 2–3-fid; anth. small, narrow, cells parallel, glabrous, crest 0; ov. hairy, style glabrous, stigma ciliate with long hairs; fr. subglobose, ½ in. diam., shortly beaked, smooth, beak truncate; seeds few, large, enclosed in white spongy pulp.

Forests in moist low country; rare. Hewesse; Reigam Korale. Fl. Sept.; greenish-white, lip veined with pink.
Endemic.

4. **A. acuminatum,** *Thw. Enum.* 317 (1861).
C. P. 3466.
Fl. B. Ind. vi. 237.

Rootstock widely creeping, as thick as a swan's quill, clothed with red imbricating sheaths ½-1 in. long; leafing stem 2–4 ft., slender, leafless below, but covered with long green sheaths mottled with black, the lowest red-brown; l. 5–6 by 1½ in., shortly petioled, oblong-lanceolate, finely acuminate, subcoriaceous, glabrous on both surfaces, base subacute, sheath green, ligule about as broad as long, entire; flg. stem very short, decumbent, clothed with short, imbricating, obtuse, tumid scales; spike subglobose, 1–1½ in. diam.; bracts under 1 in., obovate-oblong or rounded, obtuse, puberulous, margins tomentosely ciliate, inner shorter, broader; fl. about 1 in. across the limb, cal.-tube ventricose, silky, as long as the

cor.-tube; cor.-tube ½ in. long, slender, pubescent, segm. linear, obtuse, tips pubescent; lip as long as or longer than the cor.-segm., orbicular, 3-lobed, mid lobe emarginate; anth.-cells short, divergent above, ciliate, crest semilunar, crenulate.

Moist low country; very rare. I have seen only the C. P. specimens from Ekmaligoda, Sabaragamuwa. Fl. April; yellow, orange within the lip.
Endemic.

5. **A. fulviceps,** *Thw. Enum.* 317 (1861).
C. P. 3122.
Fl. B. Ind. vi. 237.

Leafing stem 6–10 ft., stout; l. 1–2 ft. by 2½–3 in., sessile, or very shortly petioled, oblong- or linear-lanceolate, acuminate or caudate, quite glabrous on both surfaces, subcoriaceous, base acute, sheath glabrous, ligule as broad as long, entire, coriaceous; flg. stem 2–4 in., procumbent and ascending, stout, clothed with broad, short, imbricating sheaths; spike oblong, ovoid or subglobose, up to 4 in. long and 2½–3 in. diam.; bracts 1–1½ in., closely imbricate, broadly ovate-oblong, retuse, appressedly fulvously hairy and villously ciliate, when living dark blood-red, tipped with yellow, when dry almost golden-brown; fl. hardly longer than the bracts, cal.-tube ventricose, as long as the cor.-tube, lobes ovate, obtuse; cor.-tube 1½ in., segm. ⅓ the length of the tube, oblong, obtuse, densely hairy externally, dorsal twice as broad; lip orbicular or flabelliform, 3–4-lobulate and crenulate, about as long as the cor.-segments, base 2-toothed; anth.-cells widely divergent above, hairy, crest semilunar, emarginate; style hairy.

Forests in lower montane zone; rare. Raxawa; Dolosbagie; Hantane (N. C. Potter). Fl. Feb.; pale yellow, bracts orange-crimson.
Endemic.

6. **A. masticatorium,** *Thw. Enum.* 317 (1861).
C. P. 3701.
Fl. B. Ind. vi. 238.

Rootstock slender, creeping and rooting; leafing stem 2–8 ft.; l. 5–15 in., sessile, linear-lanceolate, caudate-acuminate, glabrous on both surfaces, subcoriaceous, base acute or obtuse, sheath glabrous, ligule 1½ in., oblong-lanceolate, obtuse or acute, white, scarious; flg. stem 2–3 in., procumbent, flexuous or tortuous, loosely clothed with short sheaths, tomentose; spike globose, 1½ in. diam.; bracts under 1 in., obovate, obtuse, hairy and ciliate; fl. 1½ in. broad; cal.-tube membranous, glabrous, as long as the cor.-tube, 3-fid, tips of lobes bearded; cor.-tube ½–1 in. long, twice as long as the bracts, loosely villous, outer segm. oblong, obtuse, dorsal twice as broad; lip

orbicular, 3-lobed, side lobes large, broad, mid lobe smaller, bifid, lobules rounded, base 2-toothed; anth.-cells glabrous, narrow, divergent from the middle upwards, crest semi-lunar, crenate; fr. $\frac{3}{4}$ in. diam., globose, echinate.

Forests of lower montane zone; rare. Hantane, abundant. Fl. April, May; yellow, lip dotted with red.

Endemic.

Rhizome aromatic, chewed with betel.

7. **A. graminifolium,** *Thw. Enum.* 430 (1864).
C. P. 3820.
Fl. B. Ind. vi. 238.

Rootstock slender, $\frac{1}{4}$–$\frac{1}{3}$ in. diam., creeping, rufous, root-fibres long, much thickened upwards; leafing stem 3–5 ft., about as thick as a goose-quill; l. 12–14 by $\frac{1}{2}$–$\frac{3}{4}$ in., shortly petioled, linear, acuminate, with a filiform tail 1–2 in. long, base narrowed, subcoriaceous, glabrous, midrib slender, sheath long, terete, ligule short, rounded or truncate; flg. stems many at intervals on the rootstock, 2–3 in. long, flexuous, clothed with cucullate, oblong, imbricating scales; spike obovoid or subglobose, 1 in. diam.; bracts $\frac{2}{3}$ in. long, linear-oblong, membranous, glabrous; fl. 1 in. broad; cal.-tube as long as the cor.-tube, ventricose, 3-toothed, teeth bearded; cor.-tube 1 in. long, slender, glabrous, segm. linear-oblong, obtuse, half as long as the tube or more, dorsal broadest; lip longer than the cor.-segm., obovate, truncate; anth.-cells ciliate, divergent above, crest $\frac{2}{3}$ in. broad, as long as the cells, reniformly flabellate, entire.

Moist low country; rare. Abundant in Singhe-raja Forest. Fl. May.
Endemic.

8. **A. ciliatum,** *Baker in Fl. B. Ind.* vi. 238 (1892).
A. fulviceps, var. β, Thw. Enum. 317. C. P. 3704.
Fl. B. Ind. vi. 238.

Rootstock very stout, creeping, with thick root-fibres; leafing stem 3–4 ft., stout, erect; l. 12 by $1\frac{1}{2}$–2 in., sessile, lanceolate, caudate-acuminate, base acuminate, coriaceous, finely pubescent beneath, sheath long, loose, margins above ciliate, ligule short, rounded; flg. stem 3–4 in., ascending from the rootstock, very stout, sheathed with large rounded loosely imbricating scales, upper scales oblong with tomentosely ciliate margins; spike ovoid or oblong, $1\frac{1}{2}$–2 in. long by 1–$1\frac{1}{2}$ in. diam.; bracts 1 in., oblong, obtuse, pubescent, margins densely ciliate; fl. $1\frac{1}{4}$ in. broad, shorter than the bracts; cal.-tube $\frac{2}{3}$–$\frac{3}{4}$ in., ventricose, silkily pubescent, entire or bifid, coriaceous; cor.-tube as long as the cal., stout, silky, funnel-shaped above,

segm. ½ in., oblong, obtuse, silky dorsally; lip oval, longer than the cor.-segm.; fil. stout, anth.-cells hairy, tips divergent, crest transversely oblong, entire.

Moist low country; very rare. I have only seen the C. P. specimens from Reigam Korale, collected in 1861. Fl. March.
Endemic.

9. **A. hypoleucum,** *Thw. Enum.* 318 (1861).
C. P. 3532.
Fl. B. Ind. vi. 240.

Rootstock very stout, annulate, emitting many long flexuous straw-coloured, naked, spike-bearing stems, several feet long; leafing stem, 4–5 ft. long and about 1 in. thick at the base; l. 1½–2 ft. by 3–5 in., petioled, oblong-lanceolate, acuminate, base acute, glabrous and shining above, appressed pubescent with silvery-white hairs beneath, petiole 1–3 in., sheath loose, ligule short, 2-lobed; peds. many, ascending from the nodes of the flg. stems, 1–2 in. long, stout, clothed with oblong, thin, pale scales; spikes narrow, pale, 3-fld., 1½–2 in. long, ovate; bracts oblong, retuse, membranous, much shorter than the fl., glabrous, pale; fl. 2 in. broad and upwards; cal.-tube 1½-2 in. long, oblong, spathiform, tumid, 3-toothed or -lobed; cor.-tube as long as the cal., slender, glabrous, segm. 1 in., subequal, oblong, obtuse or dorsal mucronate; lip much larger than the cor.-segm., 1–1½ in. broad, orbicular, base cuneate, narrowed into a linear claw; anth.-cells glabrous, hardly divergent above, crest semilunar; stigma globose; fr. globose, 1 in. diam., smooth, deeply 6-lobed, dark red.

Damp forests 1–4000 ft.; very rare. Alagalla. Fl. June, July; white, lip stained with yellow and veined with pink.
Endemic.

10. **A. pterocarpum,** *Thw. Enum.* 317 (1861).
C. P. 3021.
Fl. B. Ind. vi. 241.

Rootstock very stout, annulate, root-fibres vermiform; leafing stem 3–6 ft. or more; l. 1–3 ft. by 2–6 in., sessile, oblong-lanceolate, acuminate, base acute, membranous, glabrous on both surfaces, sheath smooth, ligule ½–1 in. membranous, bipartite, segm. lanceolate, acute; flg. stems ascending from the rootstock at the base of the stem, 2–5 in. long, very stout, woody, clothed with large deciduous sheaths; spike ovoid or globose, few-fld., 1 in. diam., elongating in fr.; bracts 1½ in., oblong, glabrous, caducous, white; fl. pedicelled, 2 in. broad; cal.-tube ¾–1 in., spathiform, 3-toothed, glabrous; cor.-tube as long as the cal., slender,

segm. $\frac{1}{2}$–$\frac{2}{3}$ in., linear, obtuse, dorsal broader, oblong; lip broadly ovate or orbicular, longer than the cor.-segm., narrowed into a linear claw, base 2-toothed; anth. $\frac{1}{2}$ in. long, cells glabrous, very narrow, tips divergent, crest short, semilunar, 3-lobed; fr. 1–1$\frac{1}{2}$ in., stoutly pedicelled, crowded on the thickened ped., ovoid, curved, fleshy, 9-ribbed, ribs acute or winged; seeds many, small, obtusely winged, immersed in pulp.

Forests in moist zone 2–4000 ft.; rather common. Hantane; Watagoda. Fl. Aug.–Nov.; white, lip stained with orange.
Endemic.
The seeds are aromatic in a sweet pulp.

11. **A. echinatum,** *Willd. Sp. Pl.* i. 8 (1797).
Moon, Cat. 2. Thw. Enum. 316. C. P. 3020.
Fl. B. Ind. vi. 242. Rumph. Amb. vi. t. 61, f. 1.

Rootstock short, with short internodes; leafing stem 6–12 ft., very stout; l. 1–2 ft. by 2–3 in., sessile, linear-lanceolate, acuminate or caudate, base acuminate, glabrous on both surfaces, almost black-green above, pale beneath, sheath loose, glabrous, ligule $\frac{1}{2}$–$\frac{2}{3}$ in. long, truncate or rounded, entire, coriaceous, with membranous margins; flg. stem about 12 in., very stout, erect, procumbent or ascending, as thick as the thumb, bright red below, clothed with obtuse, coriaceous, imbricating scales 1–2 in. long; spike nodding, subglobose or ovoid, 1$\frac{1}{2}$–2 in. diam.; bracts 1 in., oblong, obtuse, sparsely hairy, dark brown; fl. about 1 in. broad; cal.-tube broad, ventricose, glabrous; cor.-tube 1 in., rather longer than the bracts, curved, segm. $\frac{2}{3}$ in. long, oblong, obtuse; lip rather longer than the cor.-segm., broader than long, suborbicular, fleshy, concave, clawed, 3-lobed, claw linear, base 2-toothed, lobes rounded; anth.-cells ciliate, hardly divergent above, crest transversely oblong, $\frac{1}{2}$ in. broad, more or less 3-lobed; style hairy; fr. globose, 1 in. diam., stoutly pedicelled, copiously armed with hooked spines, dark purple, shining.

Forests of moist region 1–4000 ft.; rather common. Fl. Sept., Oct.; cream-coloured, lip orange, speckled with red.
Endemic (?).*

12. **A. Benthamianum,** *Trim. in Journ. Bot.* xxiii. 245 (1885).
C. P. 3864.
Fl. B. Ind. vi. 242.

Rootstock slender; leafing stem 2–4 ft., slender; l. 6–10 by 1–1$\frac{1}{2}$ in., petioled, linear-lanceolate, caudate-acuminate, base

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* Willdenow's species is based on Kœnig's *Amomum* No. 2 in Retz. Obs. Bot. iii. 50. No locality is given, but all the plants described in that treatise were obtained in the Malay Peninsula.

acuminate, glabrous above, minutely puberulous beneath, petiole ½ in., sheath slender, margins villous, ligule ⅔ in., villously bearded; flg. stem 2–3 in., stout, clothed with short oblong scales; spike globose, 1 in. diam.; bracts ½ in. long, oblong, acute, membranous, glabrous, tips tomentose; cor.-tube 1 in., segm. oblong, obtuse; anth.-cells glabrous, crest broad, 3-lobed; fr. pedicelled, ½ in. diam., ovoid, obtuse, copiously echinate with short curved spines.

Moist low country; very rare. The C. P. specimens are from Reigam Korale, 1864. Fl. Sept.

Endemic.

The specimens are very imperfect, and there is no drawing of the plant.—J. D. H.

13. **A. rufescens,** *Trim. Syst. Cat.* 92 (1885).
Elettaria rufescens, Thw. Enum. 430. C. P. 3732.
Fl. B. Ind. vi. 242.

Rootstock short, with long root-fibres; whole plant rufous-brown when dry; stem. 1½–2 ft., rather slender; l. 5–10 by 1–2 in., sessile, oblong-lanceolate, finely acuminate, base acute, firm, green, glabrous, sheath narrow, ligule short, rounded; ped. terminal on the leafy stem, short, stout, naked or with 1–2 arrested l.; spike globose, 1½–2 in. diam., involucrate by a few outer loose coriaceous bracts, inner bracts oblong, acute or cuspidate; fl. shorter than the outer bracts, ½ in. across the cor.-seg.; cal.-tube as long as the cor.-tube, narrowly funnel-shaped, broadly 2-lipped; cor.-tube ½ in. long, very slender, glabrous, segm. ⅓ in. long, almost orbicular, concave; lip rather longer than the cor.-segm., cuneately spathulate, fleshy, 3-lobed towards the apex, side lobes small, rounded, disk hairy, mid lobe small, retuse or 2-lobulate; anth.-cells glabrous, parallel, connective not produced beyond the cells; style glabrous, stigma obconic.

Lower montane zone; very rare. Dickoya. Fl. Sept.; reddish-yellow.

Endemic.

Except in the terminal infl. this species is closely allied to *A. floribundum* and *involucratum.*

[*A. vitellinum*, Lindl., was grown at Chiswick, and said to be of Ceylon origin. Figured in Bot. Reg. 1847, t. 52. It has terminal spikes on the leafing stem like *A. rufescens*, but the lip is orbicular, twice as long as the cor.-segm., and the anth. has a large trifid crest.]

8. **ZINGIBER,** *Adans.*

Rootstock horizontal, tuberous, jointed; leafing stem elongate, distinct from the flg., or bearing terminal infl.; l. distichous, oblong-lanceolate, sheaths long; spike on a leafless stem or terminal on the leafing stem; bracts large,

persistent, usually single-fld.; cal.-tube cylindric, shortly 3-lobed; cor.-tube cylindric, slender, segm. lanceolate, dorsal hooded, lateral staminodes 0, or adnate to the lip; lip cuneiform or oblong, entire or 3-lobed, sessile; fil. short, anth.-cells contiguous, parallel, connective ending in a long erect incurved slender beak as long as the cells, grooved in front, and embracing the top of the style; ov. 3-celled, cells many-ovuled, style filiform, as long as the anther beak, tip incurved within the beak, stigma small, ciliate; fr. oblong, at length dehiscent, seeds arillate.—Sp. about 30; 26 in *Fl. B. Ind.*

Side lobes of lip small.
Spike subcapitate . . . . 1. Z. WIGHTIANUM.
Spike elongate . . . . 2. Z. CYLINDRICUM.
Side lobes of lip large.
Spike cylindric . . . . 3. Z. CASSUMUNAR.
Spike conico-oblong . . . . 4. Z. ZERUMBET.

1. **Z. Wightianum,** *Thw. Enum.* 315 (1861).
C. P. 2286. *Z. squarrosum*, Wight, Ic. vi. 16 (non Roxb.).
Fl. B. Ind. vi. 244. Wight, Ic. t. 2004 (*Z. squarrosum*).

Rootstock tuberous, with fleshy root-fibres; leafing stem 4–6 ft.; l. 12–18 by 3–4 in., sessile or very shortly petioled, oblong-lanceolate, subcaudately acuminate, puberulous beneath, membranous, base narrowed, acute, sheath membranous at the 2-lobed top, ligule membranous, bifid, lobes about $\frac{1}{10}$ in., rounded, ciliate; flg. stam ascending, 2–4 in. long, straight or decurved, clothed with membranous white or pale rose col'd. or green sheaths 1–1½ in. long; spike oblong or subglobose; bracts 1½ in., narrowly oblong, green, glabrous or laxly pubescent; cal.-tube 1½ in. long, loosely tubular, membranous, sparsely hairy; cor.-tube as long as the cal., slender, sparsely pubescent, segm. about 1 in. long, narrow, acuminate; lip sessile, nearly as long as the cor.-segm., obovate or cuneate-obovate, with 2 small basal lateral lobes (staminodes?); stam. shorter than the lip, anth. ½ in. long, cells ciliate; ov. pubescent, style glabrous, stigma very small, truncate ciliate; fr. ⅔–1 in. long, oblong, curved, pericarp rather thin; seeds rather large.

Forests in low country and extending up to 4000 ft.; common. Fl. Feb.–July; yellow, lip veined with violet.
Also in Travancore.

2. **Z. cylindricum,** *Moon, Cat. Ceyl. Pl.* 1 (1824).
Thw. Enum. 315. C. P. 2287.
Fl. B. Ind. vi. 247.

Rootstock stout, annulate, with simple and tuberiferous root-fibres, tubers 1–1½ in. long, oblong or ellipsoid, brown; leafing stem 3–6 ft. or more, rather slender; l. 5–8 by 1–2 in., subsessile, very variable in form, narrowly lanceolate to oblong- or linear-lanceolate, acuminate, glabrous or sparsely pubescent beneath, mouth of sheath entire and margins pubescent, ligule very short, truncate, ciliate; flg. stem 3–9 in., erect, loosely sheathed with obtuse scales 1 in. long; spike 2–3 in., fusiform or subcylindric, about 1 in. diam.; bracts ovate-oblong or orbicular, obtuse or subacute, green, at length reddish, closely appressedly imbricate: cal.-tube loose, as long as the cor.-tube, glabrous; cor.-tube 1 in. long, slender, glabrous, decurved, segm. lanceolate, acuminate, dorsal largest; lip shorter than the cor.-segm., 3-lobed, side lobes spreading, linear, obtuse, median broadest, cuneate-oblong, truncate, with small obtuse basal auricles; anth. glabrous; ov. hairy, stigma clavate; fr. subquadrate, compressed, ½ in. diam., thinly coriaceous, retuse at base and top, red; seeds few, ⅙ in. long, turgidly ovoid, testa black, hardly shining, hilum swollen, aril white.

Damp shady places in forests of the moist region to 4000 ft.; common. Fl. Sept., Oct.; cream-coloured.

Endemic.

Very similar in habit to the common ginger, *Z. officinale*, which is only known in cultivation, but distinguished, as pointed out by Thwaites, by the entire mouth of the l. sheaths, to which may be added the colour of the lip, which in the ginger is dark purple. According to Roxburgh, *Z. officinale* very rarely flowers in India, and such were unknown to him.

3. **Z. Cassumunar,*** *Roxb. in Asiat. Res.* xi. 347 (1810).
Thw. Enum. 315. C. P. 3727.
Fl. B. Ind. vi. 248. Bot. Mag. 1426.

Rootstock stout, tuberous, over ¾ in. diam., with many vermiform roots; leafing stem 2–2½ ft., stout, clothed with sheaths; l. numerous, spreading, 9–12 by 2½–3 in., linear-lanceolate, acute, glabrous and channelled above, densely pubescent beneath, base slightly rounded, margins narrowly membranous, sheath pubescent, auricled at top, ligule very short, pubescent; flg. stem 4 in., stout, with few imbricate bracts; spike 6 in. and more, narrow, cylindrical, acute; bracts closely imbricate, broadly oval, thick, green, pubescent, margin narrowly membranous; cal.-tube ⅗ in. long, membranous, truncate, glabrous, cleft half way down; cor.-tube longer, 1 in. long, slender, glabrous, segm. lanceolate-acuminate, lateral about as long as the tube, deflexed, dorsal much

* Thought by Roxburgh to be the source of the root so called in the drug shops of India.

larger, broadly ovate, cymbiform, erect; lip suborbicular, 1 in. broad, decurved, retuse or 2-lobed, margins erose and wrinkled; anth. large, sulphur yellow, decurved, cells parallel, glabrous; style glabrous, stigma obconic, ciliate; fr. ovoid, $\frac{2}{3}$ in. long, membranous; seeds many, very small, purple.

Moist country; rare (?); cultivated only. Fl. Aug., Sept.; pale yellow. Cult. throughout Tropical Asia.

With regard to the above plant, it was described by Dr. Trimen from a Bot. Garden specimen (July 1896). He says of it: 'I am quite in doubt whether this is C. P. 3727, or whether it belongs to *Z. Cassumunar* at all;' also that 'he does not know Thwaites's plant, called var. *subglabra*.' He further describes the roots as 'very pale yellow, within nearly white, almost scentless, taste moderately bitter, not at all aromatic.' Roxburgh, the author of *Z. Cassumunar*, says it is wild in Coromandel and Behar, flowering in Nov. and Dec., and that the fresh rootstock is deep yellow, with a strong, not very agreeable, camphoraceous flavour. Dr. Trimen's description tallies fairly well with Roxburgh's and with the Bot. Mag. figure.—J. D. H.

4. **Z. Zerumbet,*** *Smith*, *Exotic Bot.* ii. 105 (1805). **Walinguru,** *S.*

Herm. Hort. Lugd.-Bat. 636; Mus. 51. Burm. Thes. 234. Fl. Zeyl. n. 2. *Amomum Zerumbet*, L. Sp. Pl. 1. Moon, Cat. 1. Thw. Enum. 315. C. P. 3699.

Fl. B. Ind. vi. 247. Herm. Hort. Lugd.-Bat. t. 637. Wight, Ic. t. 2003. Bot. Mag. t. 2000.

Rootstock very large, not much branched, hard, tuberculous, biennial, root-fibres vermiform; leafing stem 5–6 ft., about $\frac{1}{2}$ in. diam., cylindric, glabrous, annual; l. 10–12 by 2–3 in., sessile, oblong-lanceolate or oblanceolate, acuminate, glabrous, base narrowed, ligule $\frac{1}{2}$–$\frac{3}{4}$ in. long, truncate, membranous; flg. stem 12–18 in., stout, usually flexuous, clothed with long appressed obtuse sheaths with sometimes rudimentary blades; spike 3–4 in. by 2 in. diam. conico-oblong; bracts 1–1$\frac{1}{2}$ in., closely imbricate, ovate-oblong, tip rounded, glabrous, green, bright red in fr., margins membranous; cal.-tube 1 in., appressed to the cor.-tube, 3-toothed, glabrous; cor.-tube 1$\frac{1}{4}$ in., segm. ovate-lanceolate, acuminate, lateral smaller, adnate to the base of the lip; lip shorter than the cor.-segm., 3-fid, lobes obtuse, median longest; anth. glabrous; style glabrous, stigma minute, funnel-shaped, mouth ciliate; fr. 1 in. long, oblong; seeds $\frac{1}{6}$ in. long, oblong, black.

Low country, very doubtfully native, up to 2000 ft. Fl. June; very pale yellow, the lip rather darker.

Cultivated throughout Tropics of Old World.

This wild ginger has the aromatic flavour of *Z. officinale* mixed with some bitterness.

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* Name taken from Garcia ab Orto, but this Arabic name doubtfully has any claim to be this plant.

9. CYPHOSTIGMA, *Benth.*

Rootstock stout, horizontal; leafing stem short, distinct from the flg.; l. petioled, oblong-lanceolate; flg. ped. flexuous, decumbent, ascending, branched, furnished with spathaceous sheaths or bracts; fl. solitary or binate in the bracts, bracteolate, pedicelled; cal. loosely tubular, 3-toothed, at length split; cor.-tube shortly exserted, 3-lobed, lobes subequal, revolute, lateral staminodes 0; lip sessile, orbicular-reniform, broadly 3-lobed; fil. short, anth. erect, cells parallel, connective narrow, dilated above into a very broad petaloid, crisped, crest nearly as broad as the lip; ov. ovoid, 3-celled, cells many-ovuled, style filiform, stigma urceolate, mouth ciliate; fr. globose, fleshy, crowned with the cal.-segm., ribbed, many-seeded; seeds small, subglobose, testa grey, reticulate.—Monotypic.

C. pulchellum, *Benth. in Hook. Ic. Pl.* ser. 3, iv. 61 (1882).
Amomum pulchellum, Thw. Enum. 318. C. P. 2736.
Fl. B. Ind. vi. 251. Hook. Ic. Pl. t. 1380.

Stem 6–10 in., formed of compressed l. sheaths; l. $1\frac{1}{2}$–2 ft. by 3–5 in., acute at both ends, membranous, finely reticulate, midrib hairy beneath, petiole $\frac{1}{8}$ in., slender, sheaths compressed, thin, ligule bifid, lobes short, rounded; flg. stem from the base of the leafing stem, 2–4 ft. long, slender, distantly paniculately branched, internodes long or short, clothed with coriaceous oblong, obtuse, ribbed bracts 2–$2\frac{1}{2}$ in. long, branches slender, erect, clothed with tubular spathaceous bracts; fl. solitary in the sheaths terminating the branchlets, erect; cal.-tube 1–$1\frac{1}{2}$ in., coriaceous, puberulous, tip recurved; cor.-tube rather longer, slender, tomentose, segm. $\frac{1}{2}$–$\frac{2}{3}$ in., linear-oblong, pubescent, dorsal broadest; lip 1 in. long and broad, lobes short, rounded, disk smooth; fil. very short, villous, anth.-cells narrow, glabrous, tips diverging, crest $\frac{1}{2}$–$\frac{3}{4}$ in. broad, lobulate; ov. pubescent, style glabrous, stigma urceolate; fr. $\frac{2}{3}$ in. diam., 9-ribbed.

Forests in moist region to 3000 ft.; rather common. Hiniduma; Ambagamuwa; Hantane; Adam's Peak, &c. Fl. Feb.; bright pale pink. Endemic.

10. ELETTARIA, *Maton.*

Rootstock stout, horizontal; leafing stem distinct from the flg.; l. distichous, narrow; flg. stem from the base of the leafing stem, elongate, prostrate, flexuous, branched, with spathaceous bracts at the nodes, and bearing many short few-flg. racemes; bracts 2–3-fld.; fl. erect, shortly pedicelled,

bracteolate; cal. tubular, membranous, 3-lobed or toothed; cor.-tube cylindric, as long as the cal., segm. 3, dorsal broadest, suberect, concave, lateral narrow, spreading or recurved; lateral staminodes 2, small, at the base of the lip; lip obovoid, longer than the cor.-segm., recurved; anth. subsessile, cells linear, parallel, base and tips obtuse, connective thick, not produced into a crest; ov. ovoid, and style glabrous, 3-celled, cells many-ovuled, stigma small; fr. globose or oblong, 3-celled, few seeded, pericarp thin, at length loculicidally 3-valved; seeds angular, cuneiform.—Monotypic.

E. Cardamomum, *Maton in Trans. Linn. Soc.* x. 254 (1811), var. **major,** *Smith in Rees Cyclop.* xxxix. n. 2 (Sp.). **Ensal,** *S.*

E. Cardamomum, var. β, Thw. Enum. 318. Herm. Mus. 66. *Amomum Cardamomum*, L. Sp. Pl. 1. *Alpinia Granum-Paradisi*, Moon, Cat. 1. C. P. 2431.

Fl. B. Ind. vi. 251.

Rootstock woody or fleshy, branching, annulate; stem. 6–9 ft., clothed below with spongy sheaths; l. subsessile, lanceolate, 1–3 ft. by 3–6 in., caudate-acuminate, glabrous or more or less pubescent above, puberulous beneath, base very narrow, acute, sheath sparsely villous at the top, ligule short, broad; flg. stems several from the rootstock, branches long, up to 2–3 ft., bracts at the internodes linear-oblong, 1½–2 in., membranous, persistent; fl. in short 3–4-fld. racemes, shortly pedicelled, bracteolate; cal.-tube about ½ in., glabrous; cor.-segm. ½ in., linear-oblong, pale green, tips rounded; lip ⅔ in. long, obovate-spathulate, clawed, disk pubescent below the middle, margin undulate; fr. 1–1½ in., pale, finely ribbed, globose.

Forests in the moist region up to 3000 ft.; rather common. Fl. (?); lip white, streaked with violet.

There is no specimen or drawing in Hermann's Herb. The Ceylon variety is maintained as a species by Horaninow (Prod. Scit. 31).

The type form of *E. Cardamomum* is called 'Rata-ensal' here, and comes originally from Malabar. It is largely cultivated on estates in parts of the montane zone. Figured in Benth. and Trim. Med. Pl. t. 267. Rheede, Hort. Mal. xi. t. 4, 5.

'A careful comparison of growing specimens satisfies me that the plants producing respectively the round and the long Cardamoms of commerce are not distinct species. . . . . In every essential particular the structure is similar in the two plants, the only difference being that var. α, which produces the round Cardamom, is a little taller, with rather narrower and less firm leaves, and that its fr. is more aromatic as well as different in form. The seeds of both varieties are used by the Cingalese to chew with their betel, and as medicines.'—*Thwaites's Enum.* l. c.

11. CLINOGYNE, *Salisb.*

Rootstock stout, insipid, with many vermiform roots; stems many, branching, leafy; l. bifarious, oblong or oblong-lanceolate; fl. in pairs on the branches of a terminal panicle; bracts 2-fld., long, narrow, spathiform; sep. 3, free, short, narrow; pet. 3, conniving below in a tube, subequal, narrow; staminal tube cylindric, lobes petaloid, obovate, spreading, anth. 1-celled, adnate to the sides of one of the lobes; ov. 3-celled, cells 1–2-ovuled, style included, adnate to the staminal tube, tip involute, stigma dilated; fr. indehiscent, 1–3-seeded; seeds oblong or subglobose, aril lacerate, fleshy, embryo hippocrepiform.—Sp. 7 or 8; 3 in *Fl. B. Ind.*

C. virgata, *Benth. in Gen. Pl.* iii. 651 (1883). **Géta-oluwa,** *S.* *Maranta paniculata*, Moon, Cat. 1. *M. virgata*, Dietr., Thw. Enum. 320. C. P. 3465.

Fl. B. Ind. vi. 258. Wight, Ic. t. 2015 (*M. virgata*).

Rootstock elongate, as thick as a swan's quill, pale, internodes 1–2 in., with lanceolate brown sheaths at the nodes, root-fibres scattered, tortuous; stem 6–8 ft., very slender, fistular, leafless from the lower 2 or 3 ft., internodes 4–6 in., closely sheathed, lower nodes swollen; l. petioled, 4–6 by 1–1½ in., oblong-lanceolate, finely acuminate, glabrous, shining, sheath slender, ligule 0; panicle 12–18 in., erect, pyramidal, very loosely di-trichotomously branched, branches very slender, lower 6–10 in., and branchlets plano-convex, smooth, striate; bracts at the forks 1 in. long, erect, linear, acute or cuspidate, very thin; fl. shortly pedicelled, about ½ in. long; cal.-sep. 3, small, ovate, acute, erect, free; cor.-tube very short; segm. 3, oblong, acute, reflexed; stam.-tube large, broadly lobed; stam. 1, fil. short, anth. small; fr. ½–⅓ in. long, obovoid-oblong, terete, or unequal-sided, crowned with the cal.-segm., pubescent, yellow, 2–3-celled, 2–3-seeded; seeds oblong, aril small, basal, testa brown, glossy.—Sp. 7 or 8; 3 in *Fl. B. Ind.*

Moist low country; rare. Between Kittul-gala and Yattiantola (Thwaites). Moon's locality is 'Three Korales.' Fl. April; white.

Also Malabar.

Moon wrote a full botanical description of this as a new *Maranta* in a paper 'On Arrowroot,' which was published in full in the Government Gazette for May 12th, 1821, and there is a good coloured figure among his drawings in Brit. Mus.

12. PHRYNIUM, *Willd.*

Rootstock stout, tuberous or creeping; l. solitary or 2, radical, large, oblong, petiole very long, slender, erect, stem-

like, sheathed below; spike on a radical ped., or ped. adnate to the side of the petiole, bracteate, dense-fld.; sep. 3, narrow, subequal; cor.-tube cylindric, segm. 3, subequal, linear-oblong, spreading; stam.-tube longer than the cor.-tube, segm. unequal, petaloid; anth. 1-celled, adnate to the margin of a segment; ov. 3-celled, cells 1-ovuled, or 1–2 cells empty, style adnate below to the stam.-tube, tip hooked, stigma capitate or funnel-shaped; fr. subglobose, dehiscent or not; seeds 1–3, erect, aril short, fleshy, embryo curved.—Sp. 20; 8 in *Fl. B. Ind.*

Spike sessile on the rootstock . . . . . . 1. P. ZEYLANICUM.
Spike lateral, high up on the petiole . . . 2. P. CAPITATUM.

1. **P. zeylanicum,** *Benth. in Gen. Pl.* iii. 653 (1883). **Hulan-kiriya,** *S.*
Maranta spicata, Moon, Cat. 1; Thw. Enum. 320. Trim. Cat. 92. C. P. 612.
Fl. B. Ind. vi. 260.

Rootstock stout, creeping, root-fibres tortuous; l. 4–8 in., oblong or oblong-lanceolate, caudate-acuminate, membranous, base cuneate or rounded, petiole 6–14 in., slender, sheathed, inner sheaths very long; spike $1\frac{1}{2}$ in., sessile on the rootstock close to the petiole, oblong, few-fld.; bracts $\frac{1}{2}$–$\frac{3}{4}$ in, ovate or oblong, obtuse, imbricate, membranous, green; fl. about $\frac{1}{2}$ in. across; sep. $\frac{1}{8}$ in. long, narrow; cor.-tube slender, glabrous, segm. oblong, tips rounded; fr. $\frac{1}{3}$ in. long, oblong, obtusely trigonous, smooth, crowned by the sep.; seeds $\frac{1}{6}$–$\frac{1}{4}$ in. long, oblong, trigonous, pale, dorsally rounded, testa crustaceous, obtusely tubercled, hilum large, aril fleshy.

Forests in moist low country; rare. Central Prov. (Thwaites); Colombo (Moon); Dolawe Kande. Fl. July–Sept.; pale pink.
Endemic.
I have seen no good flowering specimens.—J. D. H.

2. **P. capitatum,** *Willd. Sp. Pl.* i. 17 (1797). **Et-bémi-kiriya,** *S.*
Moon, Cat. 2. Thw. Enum. 320. C. P. 3123.
Fl. B. Ind. vi. 258. Wight, Ic. t. 2016.

Rootstock tuberous, with many fleshy root-fibres; l. 16–18 by 6–8 in., oblong, acuminate, smooth on both surfaces, midrib slender, veins very many, arched, base rounded or cuneate, petiole longer than the blade, 2–3 ft., stout, terete, sheaths long, green; spike capitate, $1\frac{1}{2}$–2 in. diam., sessile on the side of the petiole above the middle (or terminating

the petiole when the leaf-blade is not very well developed); outer bracts 2–3 at the base of the spike, large, rigid, with incurved scarious tips, breaking up into tufts of fibres, inner bracts closely imbricate, oblong, 2–4-fld., acute; fl. shortly pedicelled, about 1 in. long; sep. linear, hairy; cor.-tube slender, funnel-shaped above, segm. 3, purple, spathulate, recurved, tips hairy; stam.-column 5-lobed, 2 outer lobes larger, one orbicular concave; fil. adnate to the smaller segm., anth. small; ov. hairy, stigma funnel-shaped, uncinate; fr. size of a gooseberry, turbinate, trigonous, 3-valved; seeds erect, subglobose, testa spongy, embryo curved.

Forests in moist low country to 3000 ft. Ramboda; Alagalla; Kurawiti Korale. Fl. Jan., Feb.; dark pink.

Also in S. India and Malaya.

13. **CANNA,** *Linn.*

Rootstock stout; stem simple, leafy; l. large; fl. in a terminal lax simple or branched raceme; bracts oblong, membranous; sep. 3, erect, short, stiff, persistent; cor.-tube cylindric, segments 3, subequal, lanceolate; stam.-tube short, connate below with the cor.-tube, segm. 4, petaloid, unequal, anth. adnate to one side of one of the smaller narrower segm., 1-celled; ov. 3-celled, cells many-ovuled; style flattened, adnate below to the stam.-tube, stigma capitate; fr. subglobose, echinate, pericarp at length deliquescent; seeds globose, testa thin, endosperm floury, embryo straight.—Sp. 20–30; 1 in *Fl. B. Ind.*

C. indica, *L. Sp. Pl.* 1 (1753). **Butsarana,** *S.*

Herm. Mus. 66. Burm. Thes. 53. Fl. Zeyl. n. 1. Moon, Cat. 1. Thw. Enum. 320. C. P. 3706.

Fl. B. Ind. vi. 260. Rheede, Hort. Mal. xi. t. 43.

Stem 3–4 ft.; l. 6–18 by 4–8 in., lanceolate to ovate, oval, or almost orbicular, caudate-acuminate, veins arching, sheath open above, margins membranous; raceme with the ped. a foot or more, erect, ped. with a long narrow sheath about the middle; fl. rather distant, 2–2½ in. long; bracts ½–1 in., oblong, membranous, obtuse, green; cal.-segm. ¼–⅓ in., membranous, obtuse; cor.-segm. 1 in., erect, narrow, oblanceolate, acuminate, greenish or coloured; stam. segments longer than the corolla, 3 suberect, spathulate, 1 linear, revolute; fr. erect, ½–1 in. long, subglobose or oblong, obscurely 3-lobed, crowned with the cal.-segm., pericarp echinulate, black, thin; seeds very many, globose, testa crustaceous, black, shining.

Waste places; very common throughout the island. Fl. all the year; scarlet or yellow.

Throughout the Eastern Tropics.

The S. name means 'Help from Buddha,' and is due to the use of the seeds for rosaries by Buddhist worshippers.

The Indian and Ceylon and Malayan form is *C. orientalis*, Rosc. It varies with either scarlet or yellow flowers. The seeds are known as Indian shot, and the rootstock is eaten from its abounding in starch.

14. MUSA, *Linn.*

Stem subarborescent, of convolute l. sheaths; l. very large, petioled, oblong, midrib very stout, veins horizontal; fl. in a terminal, stout spike, lower fem., upper male; bracts large, spathiform, many-fld.; fl. sessile or subsessile; cal. tubular, slit to the base in front, 5-toothed, teeth recurved, 3 outer larger; cor. a single, convex, membranous petal, opposite the slit of the cal., embracing the base of the stam. and style; stam. 5 (6th rudimentary or 0) inserted on the top of the ov., fil. erect, stout, free, anth. linear, erect, 2-celled, cells parallel; ov. 3-celled, cells many-ovuled, style erect, filiform, base thickened, stigma subglobose, 6-lobed; fr. large, oblong or fusiform, fleshy, obtusely 3–5-angled, many-seeded; seeds imbedded in pulp, more or less angular, testa crustaceous, excavate at the hilum, endosperm mealy, embryo small, close to the hilum.—Sp. about 30; 10 (?) in *Fl. B. Ind.*

M. paradisiaca, *L. Sp. Pl.* 1043 (1753). **Kehel, Gal-kehel,** *S.*

Herm. Mus. 70. Burm. Thes. 164. Fl. Zeyl. n. 368. Moon, Cat. 70. *M. Troglodytarum*, Moon, Cat. 71 (? L.). *M. sapientum*, L., Moon, Cat. 70; Thw. Enum. 321. C. P. 3731.

Fl. B. Ind. vi. 262 (*M. sapientum*). Roxb. Cor. Pl. t. 275 (not good), *M. sapientum.*

Rootstock stoloniferous; stem erect, 8–12 ft.; l. very stoutly petioled, 4–5 ft. long, oblong, bright green above, paler beneath; spike decurved, about as long as the l. or shorter, glabrous, ped. about 1½ in. diam. below the infl., green, glabrous; male bracts 6 by 2½ in., ovate-oblong, obtuse, deciduous; male fl. very many in each bract, 1½ in. long, nearly white; cal.-lobes ovate, acute; corolla ½ in., oblong, tip rounded; anth. ¼ in., obtuse; stigma clavate, tip constricted, truncate; fr. 4 in. long, obovate-oblong, slightly curved, suddenly constricted at the apex, and at the base into a stout pedicel ¼–½ in. long, obtusely 5-angled, golden-yellow, very many-seeded; seeds about ⅙ in. diam., subglobose, testa crustaceous, black, obscurely angled and tubercled.

By rocky steep streams in the moist region, 1–3000 ft.; common. Fl.

Also in E. Himalaya and Malaya.

Fruit eaten in times of famine.

Linnæus's two species, *M. paradisiaca* and *M. sapientum*, have no distinguishing botanical characters; both refer to cultivated plants. I use the former, as being the one to which he refers all the Ceylon and Indian synonymy, though *M. sapientum* seems generally preferred by modern botanists. We have but one wild species, and it may well be the origin of the numerous seedless forms in cultivation, distinguished by differences in shape and colour of their fruit. Hermann gives the names of 13 kinds grown in his time, and Moon records no less than 50, of which 5 are considered to be wild by him. The distinction between 'Plantains' and 'Bananas' is not made in Ceylon, and the latter word is not used here. Baker (Ann. Bott. vii. 215), following Moon, refers the wild Ceylon plant to *M. troglodytarum*, L., but I have seen nothing here with an erect inflorescence.—*Trimen.*

In the W. Indies and elsewhere, the name Plantain is used to designate the larger, coarser fruits used for cooking, that of Banana for the sweet sorts. Mr. Morris informs me that the plants of each are always distinguishable by the bracts of the male fls., those of the Banana being deciduous, those of the Plantain being persistent; as well shown in Ehret, l.c. Pl. Sel. tt. 18–20 and tt. 21–23. See also Kew Bullet. 1894, p. 254.—J. D. H.

CXXVIII.—HÆMODORACEÆ.

PERENNIAL herbs, with a short rootstock and fibrous roots; l. radical, often distichous, nerves parallel; fl. bisexual, in terminal spikes or racemes; perianth corolline, inferior or superior, lobes 6, biseriate, imbricate or induplicate valvate; stam. 6, opposite the perianth-lobes, anth. erect or versatile; ov. 3-celled, cells 1–2-ovuled, ovules anatropous, style columnar, stigma simple or 3-toothed; fr. superior or inferior, bursting irregularly, pericarp coriaceous; seeds globose, endosperm fleshy, embryo terete.

The above ordinal character applies to the tribe Ophiopogoneæ only.

Perianth superior . . . . 1. OPHIOPOGON.
Perianth inferior . . . . 2. SANSEVIERIA.

1. **OPHIOPOGON**, *Ker.*

Scapigerous herbs, stem short; l. linear, distichous, strongly nerved, base sheathing; fl. racemose on an angular scape; bracts scarious; perianth superior, tube adnate to the sides of the ov., not produced above it, segments 6, biseriate, ovate, spreading; stam. 6, inserted on the bases of the per. segments, fil. short, erect, anth. basifixed; ov. turbinate, crown flat, 3-celled, cells 2-ovuled, style columnar, stigma acute or

3-toothed, ovules collateral, erect, anatropous; fr. bursting irregularly before the maturation of the globose seeds, which enlarge and ripen fully exposed.—Sp. 10 or more; 9 in *Fl. B. Ind.*

O. intermedius, *Don, Prod. Fl. Nepal.* 48 (1825).
Dianella graminifolia, Moon, Cat. 25. Thw. Enum. 339. C. P. 2294. Fl. B. Ind. vi. 269. Wight, Ic. t. 2050 (*O. indicus*).

Rootstock short; l. 10–18 by $\frac{1}{4}$–$\frac{1}{3}$ in., linear, acute or acuminate, subsecund, margins scaberulous, dark green above, pale beneath, sheaths very short, scarious, white; scape much shorter than the l., naked; raceme 3–4 in., nodding, laxly many-fld.; bracts subulate, variable in length; fl. rather distant, shortly pedicelled, drooping, about $\frac{1}{2}$ in. broad, white; per.-segments oblong, obtuse; fil. triangular, much shorter than the per.-segm., anth. narrowly oblong; stigma acute, minutely 3-toothed; seeds subglobose, $\frac{1}{3}$ in. diam., blue, crowded around and almost concealing the small withering pericarp, testa soft, blue.

Shady places in moist region to about 4000 ft.; common. Fl. Feb., March; white.
Also in the hill districts and mountains throughout India.

2. SANSEVIERIA, *Thunb.*

Stout, coriaceous, thick-leaved herbs, often stoloniferous; l. radical, narrow, flat, terete, or plano-convex in section, veins immersed; scape erect, naked, fl. racemose; perianth inferior, tube elongate, lobes 6, narrow, recurved; stam. 6, inserted on the bases of the lobes, fil. filiform, anth. dorsifixed; ov. superior, attached by a broad base, 3-celled, cells 1-ovuled, style filiform, stigma simple, ovules erect; fr. 1–3-lobed, 1–3-celled, cells 1-seeded, pericarp membranous, bursting irregularly before the maturation of the seeds which ripen exposed; seeds globose, testa soft.—Sp. 10 or 12; 2 in *Fl. B. Ind.*

S. zeylanica, *Willd. Sp. Pl.* iii. 159 (1799). **Niyanda,** *S.* **Maral,** *T.*

Herm. Mus. 56. Burm. Thes. 11. Fl. Zeyl. n. 130. *S. Roxburghiana*, Schultes f. Syst. vii. 357. *Aloe hyacinthoides*, var. *zeylanica*, L. Sp. Pl. ed. 2, 456. Moon, Cat. 25. Thw. Enum. 338. C. P. 2297.
Fl. B. Ind. vi. 270 (*S. Roxburghiana.*) Roxb. Cor. Pl. t. 184 (good). Rheede, Hort. Mal. xi. t. 42. Bot. Mag. t. 7487 (*S. Roxburghiana*).

Rootstock very stout, branching, stoloniferous; stem very short; l. about 8 or 9 in a tuft, $2\frac{1}{2}$–3 ft. by 1 in. towards the middle, suberect, dagger-shaped, rigid, pale green with transverse bands of dark green, concave above, and striate, dorsally

rounded, $\frac{1}{4}$ in. thick from back to front, margins thin, reddish, terminated by a terete, acute, rigid, spiniform, green tip 1–2 in. long; scape a foot long, cylindric, green or pale purple, with a few linear acuminate bracts 1–2 in. long; raceme 1–2 ft. long by $1\frac{1}{2}$–2 in. diam., striate, erect, cylindric; fl. in fascicles of 3–6, suberect, very shortly pedicelled, sweet-scented; bracts very minute, ovate, acute, pale green; perianth pale greenish-white, tube $\frac{1}{3}$ in. long, cylindric, lobes about as long as the tube, linear-oblong, obtuse, revolute, tips purplish; stam. erect, fil. as long as the per.-lobes, anth. oblong, versatile; ov. trigonous, 3-lobed, lobes pitted at the top, style filiform, exserted, stigma minute; fr. sparingly produced, globose, $\frac{1}{3}$ in. diam., of one fertile cell with 2 minute imperfect cells at the base, dark orange colour; seed solitary, broadly ovoid, white, albumen horny.

Dry rocky or sandy places in the dry region; common. Fl. Jan., June, &c.; greenish-white tinged with violet.

Also in S. India (*S. lanuginosa*, Willd.) and Burma.

In a note upon this plant, Dr. Trimen has shown that the *Sansevieria Roxburghiana*, Schultes f. (Fl. B. Ind. vi. 271), is the true *S. zeylanica*, Willd., and that the *S. zeylanica* of Redouté (Liliac. t. 290, and Lindl. Bot. Reg. 160, and other authors) is not a native of Ceylon. I have suggested (in F. B. Ind.) that the latter is probably African, and may have been cult. in Ceylon.

CXXIX.—AMARYLLIDEÆ.

ROOTSTOCK bulbous or tuberous; l. from the summit or side of the rootstock; scape naked; perianth petaline, superior, tube long, short, or 0, limb 6-lobed or partite; stam. 6, on the bases of the per.-segm., fil. free or connate, anth. erect or versatile; ov. superior, 3-celled, cells many-ovuled, style stout or slender, stigma simple, 3-lobed or 3-partite; ovules 2-many-seriate in the inner angles of the cells, anatropous; fr. a loculicidal capsule, bursting irregularly; seeds few or many, endosperm fleshy, enclosing the small embryo.

The so-called American Aloes, *Agave americana*, L., and *A. vivipara*, L. (Wight, Ic. t. 2024), both commonly planted in Ceylon, as elsewhere in India, belong to this Order.

The apparent absence of the little star-flowered *Hypoxis aurea*, L., in Ceylon, is remarkable, it being a common plant in the hilly parts of all India from Kashmir to the Nilgiris, and in Burma, Java, and China.

Rootstock tuberous . . . . 1. CURCULIGO.
Rootstock bulbous.
  Fil. free . . . . 2. CRINUM.
  Fil. united by a membrane . . . . . . 3. PANCRATIUM.

1. **CURCULIGO,** *Gaertn.*

Rootstock tuberous; l. lanceolate, plaited; scape short or long; fl. spicate or racemed, sometimes unisexual; perianth superior, tube adnate to the ov., produced above it or not, limb rotate, 6-partite; stam. 6, inserted on the bases of the per.-segm.; fil. short, anth. linear, erect; ov. 3-celled, beaked or not, cells 2- or more-ovuled, style columnar, short, stigmas 3, erect, oblong; ovules anatropous, funicle elongate; fr. indehiscent, pericarp thin, few or many-seeded; seeds subglobose, testa black, crustaceous, shortly beaked at the hilum.—Sp. about 12; 6 in *Fl. B. Ind.*

Per-segm. sessile on the top of the ov. . . 1. C. FINLAYSONIANA.
Per-segm. on the elongate slender top of the ov. 2. C. ORCHIOIDES.

1. **C. Finlaysoniana,*** *Wall. Cat.* n. 5162 (1828). **Ma-biutal,** *S.*
Curculigo angustifolia and *C. pauciflora*, Moon, Cat. 25. *Hypoxis latifolia*, *H. pauciflora*, and *H. brachystachya*, Wight, Ic. vi. 22. *H. trichocarpa*, Wight, Thw. Enum. 323. *Molineria Finlaysoniana*, Baker in Journ. Linn. Soc. xvii. 121. C. P. 2288, 2290.
Fl. B. Ind. vi. 278. Wight, Ic. tt. 2044, 5, and 6.

Rootstock fusiform; l. long-petioled, 12–24 by 1–1½ in., linear to oval-lanceolate, finely acuminate, glabrous or sparsely hairy, membranous, 5-veined, petiole 2–8 in., very slender, sheaths short; scape 1–3 in. long, slender, silkily villous; fl. in a short, erect, or inclined few or many-fld. raceme; pedicels 1–1½ in., spreading, capillary, villous, bracts filiform, upper fl. male; per.-segm. sessile on the top of the ov., ⅓ in. long (of male fl. shorter) ovate-oblong, acuminate, dorsally silky; ov. clavate, villous; fr. ⅓–¾ in., oblong or pyriform, curved, few-seeded, pericarp thin; seeds ovoid-oblong, testa finely deeply striate, black shining.

Var. β, **linearifolia,** *Thw.* l. c.

L. 12–20 by $\frac{1}{10}$–$\frac{1}{6}$ in.

Moist low country up to 3000 ft.; rather common. Fl. March, October; bright yellow.
Also in S. India.

C. recurvata, Dryand, *Waya-pol*, S., is a very common garden plant. Moon (Cat. 25) gives it from 'Saffragam' (Sabaragamawa), and it is C. P. 3210; but it has no claims to be treated as native.

2. **C. orchioides,** *Gaertn. Fruct.* i. 63 (1788). **Hin-biutal,** *S.* **Nilappanai,** *T.*
C. latifolia, Moon, Cat. 25 (non Dryand). Thw. Enum. 324. C. P. 2289.
Fl. B. Ind. vi. 279. Wight, Ic. t. 204 (*C. brevifolia*).

* G. Finlayson was in Ceylon in 1817–18, and ascended Adam's Peak in the former year. Surgeon and naturalist to the Siam Mission, 1821; died 1823.

Rootstock stout, short or elongate, with copious fleshy root-fibres; l. sessile, 6–18 by ½–1 in., linear to lanceolate, acuminate, membranous, 5-veined, tips sometimes rooting or reaching the ground, glabrous or softly sparsely hairy, base sheathing; scape very short, clavate, with the pedicels, bracts, and ov. hidden amongst the leaf-sheaths, flattened; raceme subcorymbiform, fl. subdistichous, lowest in the raceme perfect, upper male; bracts lanceolate, membranous; perianth produced above the ov. in a filiform, hairy, very slender stipes ½–1 in. long, which alone with the per.-segments appears above ground, segm. ½–⅔ in. long, oblong-ovate, acute, dorsally hairy; stam. small, fil. very short, anth. linear; ov. lanceolate, cells 6–8-ovuled, style short; fr. oblong, ½ in., hypogæous, 1–4-seeded, septa spongy; seeds oblong, testa deeply grooved in wavy lines, black, shining.

Low country up to 3000 ft., in grassy places; common. Fl. April–July; bright yellow.

Also in E. Himalaya, S. India, Java.

The long slender beak of the ov. resembles a pedicel or scape, and, the raceme and ov. being concealed in the l. sheaths, the perianth segm. assume the appearance of a whole flower.

2. CRINUM, *Linn.*

Herbs, with large coated bulbs; bulb often produced upwards into a stout, long, or short neck; roots from the short rootstock, or base of the bulb, numerous, vermiform; l. numerous, oblong-lanceolate or strap-shaped; fl. large, umbelled on a stout, solid scape, with membranous bracts; perianth funnel- or salver-shaped, tube long, lobes 6, narrow; stam. 6, inserted on the throat of the perianth, fil. filiform, free, deflexed or spreading, anth. linear or oblong, dorsifixed; ov. 3-celled, cells few-ovuled, style filiform, stigma simple; fr. large, subglobose, pericarp membranous or coriaceous, bursting irregularly; seeds few, large, testa thick, endosperm fleshy.—Sp. about 60; 12–15 in *Fl. B. Ind.*

Perianth salver-shaped; stam. spreading.
L. 3–5 ft. by 5–8 in. . . . . 1. C. ASIATICUM.
L. 2–3 ft. by ¾–1½ in. . . . . 2. C. DEFIXUM.
Perianth funnel-shaped; stam. declinate . . . 3. C. ZEYLANICUM.

1. **C. asiaticum,** *L. Sp. Pl.* 292 (1753) (in part). **Tolabo,** *S.* **Vichamunkil,** *T.*

Herm. Hort. Acad. Lugd.-Bat. 682; Mus. 55. Burm. Thes. 142. Fl. Zeyl. n. 127. *C. toxicarium*, Roxb. Fl. Ind. ii. 134; Moon, Cat. 24. Thw. Enum. 324. Baker, Handb. Amaryll. 75. C. P. 2969.

Fl. B. Ind. vi. 280. Herm. Hort. Lugd.-Bat. t. 683. Bot. Mag. t. 1073 (very good). Wight. Ic. t. 2021–2.

Bulb 2–3 or more in. diam., narrowed into a neck a foot high, which is clothed with old l. sheaths; l. 3–5 ft. by 5–8 in., linear-lanceolate, shortly acuminate, flat, narrowed into the sheathing base, coriaceous, bright green, margins smooth; scape from the axils of the old leaves, 1½–3 ft., up to 1 in. diam., compressed; bracts 2, spathiform, 3–4 in. long, oblong, acute, papery, bracteoles filiform; umbel 10-50 fld.; somewhat bipartite, with a tuft of bracteoles in the sinus; pedicels ¼–1 in.; per.-tube 3–4 in., cylindric, slender, segm. rather shorter, linear, recurved, or revolute; fil. very slender, shorter than the per.-segm., anth. reddish, ½–¾ in.; fr. rarely produced, subglobose, 1–2 in. diam., 1- rarely 2-seeded, beaked by the fleshy base of the perianth, dehiscing irregularly.

Sandy seacoast, chiefly in the moist region; very common. Fl. Feb.–May; white, sweet-scented.

Throughout India.

Linnæus probably included *C. defixum* under this. When not in flower, the leaves much resemble that of an *Agave*.

2. **C. defixum,** *Ker in Quart. Journ. Sci. and Arts*, iii. 105 (1817). **Hin-tolabo,** *S.*

C. asiaticum, Roxb. Fl. Ind. ii. 127; Moon, Cat. 24. Thw. Enum. 324. C. P. 2338.

Fl. B. Ind. vi. 281. Rheede, Hort. Mal. xi. t. 38. Bot. Mag. t. 2208.

Bulb globose or oblong, 3–4 in. diam., base stoloniferous, neck stout, 2–6 in. long; l. few or many, 2–3 ft. by ¾–1½ in., linear, obtuse or acute, concave, thick, dark green, margins slightly rough; scape from the axils of the lowest l., 1½–2½ ft., erect, cylindric, bracts 2, 1½–2 in., oblong-lanceolate, subacute, bracteoles filiform; umbel 6–15-fld., pedicels very short; tube of perianth 2½–5 in., slender, cylindric, segm. nearly as long, narrowly linear-lanceolate, subacute, reflexed or drooping; fil. shorter than the per.-segm., spreading, bright red, anth. ½ in.; style declinate, stigma simple; fr. subglobose, 1 in. diam., shortly pedicelled, beaked by the per.-tube, 1-celled, 1- or more-seeded, pericarp membranous; seeds rugose.

In streams and wet places in the low country; rather common. By Mahaweli, near Peradeniya, abundant; Badamua, S. Prov.; Heneratgoda; Batticaloa (Gardner); Trincomalie (Glenie). Fl. March–July; white, filaments and style purple.

Throughout India.

Crinum strictum, Herb. in Bot. Mag. t. 2635, said to be from Ceylon, may be *C. defixum*.

3. **C. latifolium,** *Linn. Sp. Pl.* 291 (1753). **Tolabo,** *S.* **Vishamungil,** *T.*

Baker, Handb. Amaryll. 87. Trim. in J. Bot. xxii. 167. *C. ornatum*, Thw. Enum. 324. C. P. 3734.

Fl. B. Ind. vi. 285. Bot. Reg. t. 579 (*Amaryllis insignis*). Bot. Mag. t. 923 (*A. ornata*, Willie). Rheede, Hort. Mal. xi. t. 39.

Bulb large, elongate, ovoid or globose, 5–6 in. diam., narrowed into a stout neck; l. many $2\frac{3}{4}$ ft. by 3–4 in., lorate or oblong-linear, acuminate, flat, margin slightly scabrous; scape inserted on the neck of the bulb, about as long as the l., stout, tinged with purple; bracts 3–4 in., oblong or broadly lanceolate, inner linear; umbel 10–20-fld., pedicels very short; perianth-tube 3–6 in., curved, cylindric, limb nodding, 3–4 in. long, funnel-shaped, segm. about 3–4 by 1 in., oblong-lanceolate, acute; stam. declinate, about $\frac{1}{3}$ shorter than the per.-segm., anth. $\frac{1}{2}$–$\frac{3}{4}$ in. long; style longer than the stam.; ov.-cells 5–6-ovuled; fr. subglobose, $1\frac{1}{2}$–2 in. diam.

Var. β, **zeylanicum,** *C. zeylanicum*, Linn. Syst. Ed. xii. 236. Baker, l. c. C. P. 3735.

Handbk. Amaryll. 87. Bot. Mag. t. 1171 (*Amaryllis ornata*). Wight, Ic. tt. 2019, 20.

Bulb subglobose, 6–8 in. diam., neck short, l. fewer, shorter, undulate, per.-segm. with a very dark purple central fascia almost reaching the tip.

Damp places in the low country; common. Fl. Jan.–June; white, with pink or purplish stain down centre of per.-segm.

Throughout the Tropics of Old World.

An extremely variable plant; perhaps several species are included under it, but I cannot separate them.—*Trimen.*

In Dr. Trimen's MSS., *C. latifolium* is placed under *C. zeylanicum* as a var. β, *latifolium*, but this must be an oversight, for in the Sp. Pl. *C. latifolium* was published as a *Crinum*, and *C. zeylanicum* as an *Amaryllis.* I have Mr. Baker's authority for the course here adopted and for the characters of the var.—J. D. H.

3. PANCRATIUM, *L.*

Bulbous herbs; l. linear or lanceolate; scape solid; fl. large, umbelled or solitary; bracts 1–2, large, membranous, inner linear, hyaline; perianth funnel-shaped, tube cylindric, segm. narrow; stam. 6, inserted in the throat of the perianth, fil. united by a toothed membrane and with it forming a cup, anth. dorsifixed; ov. 3-celled, cells many-ovuled, style filiform, stigma small; fr. subglobosely 3-gonous, loculicidally 3-valved, many-seeded; seeds angular, testa lax, black.—Sp. about 12; 6 in *Fl. B. Ind.*

P. zeylanicum, *L. Sp. Pl.* 290 (1753). **Wal-lunu,** *S.*

Herm. Hort. Acad. Lugd.-Bat. 691; Mus. 61. Burm. Thes. 142. Fl. Zeyl. n. 126. Moon, Cat. 24. Thw. Enum. 324. Baker, Handb. Amaryll. 118. C. P. 3211.

Fl. B. Ind. vi. 285. Herm. Hort. Lugd.-Bat. t. 692 Bot. Reg. t. 479. Bot. Mag. t. 2538.

Bulb globose, 1½–2 in. diam., neck 0; l. 8–12, bifarious, 6–11 in., linear-lanceolate, acuminate, thin, glossy green; scape slender, subterete, much shorter than the l., 1-fld.; bract solitary, as long as the corolla-tube, base tubular; pedicel very short; per.-tube 1–1½ in. long, throat broadly funnel-shaped, limb 2–3 in. across, segm. lanceolate, as long as the tube; staminal cup toothed, fil. much longer than the cup, 1–1¼ in. long; anth. ¼ in. long.

Low country, in grassy places; common. Fl. Jan., &c.; white, fragrant.

Throughout Trop. Asia.

Bulb used medicinally.—*Thwaites.*

P. verecundum, Sol. in Ait. Hort. Kew. i. 412, is 'stated to be a native of the island' (Thw. Enum. 324). A plant so named is figured from S. India in Wight, Ic. t. 2023, and I believe bulbs sent from the E. Prov. by Mr. Nevill and cultivated for a few years in the Botanic Garden to have been this plant, which is stated in Fl. B. Ind. vi. 286, to be a very different species from true *P. verecundum.*—*Trimen.*

I find amongst Dr. Trimen's papers a flower of this plant, from the Peraden. Garden, but without more material it is impossible to determine its species. It is not either *P. verecundum*, Ait., or *P. malabaricum*, Wight. The per.-tube is 3 in. long, its segm. about 1 in. long, very narrow, the staminal cup is too mutilated to determine its form, anth. about ⅙ in. long, as long as their fil.—J. D. H.

P. triflorum, Roxb. (*P. malabaricum*, Herb.) is given for Ceylon in Fl. B. Ind. vi. 285, on Thwaites's authority. Herbert's species is based upon the figures in Rheede, Hort. Mal. xi. t. 40, which represents a plant with 8 rather small flowers in an umbel. To this species Thwaites refers C. P. 2339, which consists of garden specimens of *Hymenocallis tenuiflora*, Herb., and he states (Enum. 324) that it is found on banks of rivers and streams up to 2000 ft., and is called 'Diya-manel.' Some confusion seems to have occurred (see also Fl. B. Ind. vi. 286). I have seen it only in Peradeniya Gardens.—*Trimen.*

CXXX.—TACCACEÆ.

ROOTSTOCK very large, tuberous; l. radical, tripartite, segm. costate, penniveined; ped. radical, naked; fl. umbelled, greenish-brown; invol. of 6–12 spathes, with many inner filiform bracts; perianth superior, subglobose, fleshy, 6-lobed, mouth contracted, lobes 2-seriate, imbricate in bud; stam. 6, inserted on the bases of the lobes, fil. very short, dilated into an inflexed hood, anth. sessile within the hood, 2-celled; ov. 1-celled, with 3 parietal many-ovuled placentas, styles short, stigmas 3, broad, reflexed over the style; fr. baccate, 6-ribbed; seeds many, testa striate, endosperm hard, embryo minute.

TACCA,* *Forst.*

For characters, see Order.—Sp. about 10; 4 in *Fl. B. Ind.*

T. pinnatifida, *J. and G. Forst. Char. Gen.* 69 (1778). **Garandi-kidaran,** *S.*

Thw. Enum. 325. C. P. 2320.

Fl. B. Ind. vi. 287. Rumph, Herb. Amb. v. t. 114. Lam. Encycl. t. 232. Regel, Gartenfl. t. 582.

Rootstock globose, 6–10 in. diam. and upwards, with superficial rootlets; l. 1–3 ft., broad, circular in outline, 3-partite, segm. variously pinnatifid, margins undulate; petiole 2–3 ft., terete, striate, hollow; ped. much longer than the petiole, tapering upwards, terete, striped pale and dark green; invol. bracts 6–12, oblong-lanceolate, acuminate, recurved, striped with purple; bracteoles filiform, much longer than the bracts, pendulous round the ped.; fl. 10–40, drooping, pedicelled, about $\frac{2}{3}$ in. diam., greenish, per.-lobes margined with purple, connivent; fr. the size of a pigeon's egg, yellow; seeds angular.

Dry region, rather rare, in grassy open places. Bintenne (Gardner); Trincomalie (Glenie); Batticaloa (Thwaites); Jaffna; Nilgala, abundant. Fl. March; green, tinged with purple.

Also in India, Malaya, Pacific Is., Australia.

Rumph's plate above quoted well represents the Ceylon form. The original Pacific Island plant differs considerably from ours, and is well figured in Bot. Mag. tt. 7299, 7300.

The leaves are remarkably similar to those of an *Amorphophallus.* The rootstock is intensely bitter when raw. It is full of starch, which, when prepared, is of excellent culinary properties. The plant is extensively cultivated in some parts of India and in other tropical countries.

CXXXI.—DIOSCOREACEÆ.

Herbs, with usually very large tuberous or elongated, simple, or branching roots or rootstocks (except *Trichopus*); stems slender, twining (erect in *Trichopus*), terete, angled, or winged, prickly or unarmed, often tuberiferous in the l. axils; l. opp. or alt., entire or digitately 3–5-foliolate, 3–9-veined; fl. small or minute, spicate or racemose, spikes or racemes in a pendulous simple or branched filiform rhachis, 1–3 bracteolate, unisexual (fl. bisexual in axillary fascicles in *Trichopus*); perianth 6-cleft, in 2 series; male fl.:—perianth rotate, segm. broad

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* Name, according to Rumph, derived from the Amboynan Täa. The Pacific Island species or form is the cultivated 'Pia' of the natives, which yields an important food.

and imbricate, or narrow and subvalvate, incurved or spreading; stam. 6 (3 sometimes imperfect or 0), inserted at the base of the segm., round a more or less developed pistillode, fil. short, anth. oblong or globose, dehiscence lateral; fem. fl.:—perianth superior, as in the male; staminodes 3 or 6; ov. trigonous, 3-celled, cells 2-ovuled, style short or 0, stigmas 3, spreading, linear, entire, or bifid; fr. a 3-celled, 3-winged, loculicidal capsule, dehiscing through the wings (or a berry with oblong seeds in *Trichopus*); seeds flat, variously broadly winged, embryo small, included in a hard endosperm.

Tall climber . . . . 1. DIOSCOREA.
Stem short, erect . . . . 2. TRICHOPUS.

1. DIOSCOREA, *Linn.*

For characters, see Order.—Sp. very many; 25 in *Fl. B. Ind.*

L. 3–5-foliolate.
  L. softly tomentose beneath . . . . . 1. D. TOMENTOSA.
  L. glabrous, or sparsely hairy beneath . . 2. D. PENTAPHYLLA.
L. simple.
  Perianth-segm. broadly ovate or orbicular.
    L. opp.
      Rhachis of spike pubescent . . . 3. D. OPPOSITIFOLIA.
      Rhachis of spike glabrous . . . . 4. D. INTERMEDIA.
    L. alt. . . . . 5. D. SPICATA.
  Perianth-segm. narrow . . . . . 6. D. SATIVA.

1. **D. tomentosa,** *Heyne in Roth, Nov. Pl. Sp.* 371 (1821). **Uyala,** *S.*
Thw. Enum. 326. C. P. 2304.
Fl. B. Ind. vi. 289. Wight, Ic. t. 815.

Root-tubers 1–2 ft. long; stem prickly towards the base and sometimes on the branches and petioles, tomentose, not tuberiferous; l. alt., 3–5-foliolate, glabrous above, clothed beneath with white tomentum, petiole 3–4 in., leaflets 2–4 in., shortly petiolulate, obtuse, acute or cuspidate, lateral dimidiate-ovate, 3-pliveined, median oval or obovate; male racemes $\frac{1}{2}$–1 in., very slender, usually 3-nate on the rhachis and branches of a very slender, flexuous, tomentose panicle 10–15 in. long; bracts broad, ovate, cucullate, upper as long as the fl.; perianth about $\frac{1}{15}$ in. diam., outer segm. tomentose, broadly ovate, obtuse, inner narrower, more glabrous; stam. 3, nearly as long as the segm., staminodes 3, as long as the stam., tips dilated; pistillode columnar; fert. fl. in axillary pendulous, tomentose racemes 10–16 in. long; ov. about $\frac{1}{8}$ in. long; per.-segm. rather larger than in the male, outer nearly orbicular,

inner smaller; staminodes 3, minute; style short, stigmas spreading, tips dilated, emarginate; fr. 1 in. long, cuneately oblong, truncate, tomentose, valves polished within; seeds $\frac{1}{4}$ in. long, obovate-oblong, wing terminal, as long as the nucleus and broader.

Moist region to 2000 ft.; common. Fl. yellowish-white.
Also in Peninsular India.
Roots eaten.

2. **D. pentaphylla,** *L. Sp. Pl.* 1032 (1753). **Katawala,** *S.* **Allai,** *T.*

Fl. Zeyl. n. 363. Moon, Cat. 69. Thw. Enum. 325. C. P. 2869.
Fl. B. Ind. vi. 289. Rheede, Hort. Mal. vii. t. 35. Wight, Ic. t. 814.

Root-tubers 5–6 ft. long; stem slender, glabrous, more or less prickly, especially towards the base, often tuberiferous in the l. axils; l. alt., 3–5-foliolate, glabrous or sparsely pubescent beneath, petiole 1–4 in., leaflets 2–6 in., shortly petiolulate, oval obovate or lanceolate, acuminate, cuspidate or subcaudate, membranous, base acute, lateral oblique at the base; male fl. in very slender racemes $\frac{1}{2}$–1$\frac{1}{2}$ in. long, which are solitary or binate on a very slender flexuous tomentose rhachis 6–12 in. long; bracts very broad, apiculate, membranous, much shorter than the fl.; perianth about $\frac{1}{16}$ in. diam., segm. glabrous or sparsely pubescent, broadly ovate, obtuse; stam. 3, anth. subsessile, staminodes 3, minute; pistillode 3-lobed; fem. fl. in axillary, flexuous, pendulous, tomentose spikes 2–6 in. long; perianth-segm. broader than in the male; staminodes 3, minute; stigmas spreading, linear; fr. $\frac{3}{4}$–1 in. long, quadrately oblong, retuse at both ends, glabrous; seeds $\frac{1}{2}$ in. long, wing terminal, longer and broader than the short oblique nucleus.

Moist low country; very common. Fl. Aug.; pale-greenish, fragrant. There is a good drawing of this in Hermann's collection, but no specimen. Roots eaten in times of famine.

3. **D. oppositifolia,** *L. Sp. Pl.* 1033 (1753). **Hiritala,** *S.*

Herm. Mus. 31. Fl. Zeyl. n. 361. Moon, Cat. 69. Thw. Enum. 326. C. P. 2303.
Fl. B. Ind. vi. 292. Wight, Ic. t. 813.

Rootstock short, with many long cylindric tortuous roots as thick as a swan's quill; stem slender, unarmed, not tuberiferous, terete, pubescent or tomentose; l. opp. rarely alt., 3–5 by 1–3 in., polymorphous, from lanceolate to oblong-oval or orbicular, obtusely acuminate or rounded at both ends, coriaceous, 3–5-veined, margins cartilaginous, sparsely hairy on both surfaces, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; male spikes $\frac{1}{4}$–$\frac{3}{4}$ in., alt. or whorled on a long filiform tomentose pendulous rhachis 4–10 in. long; fl. crowded, sessile by a broad base, nearly

glabrous, about $\frac{1}{20}$–$\frac{1}{12}$ in. broad ; bract small, ovate, acuminate, membranous ; outer perianth-segm. broadly ovate or orbicular, concave, inner smaller, obovate ; stam. 6, fil. short, anth. didymous ; pistillode obscure ; fl. fem. distant on axillary, pendulous, tomentose spikes 6–8 in. long, bracts minute ; perianth-segm. orbicular, glabrous or pubescent ; staminodes 6, minute ; stigmas linear, 2-fid ; fr. orbicular or broader than long, 1½–2½ in. diam., glabrous, top retuse or almost 2-lobed, base cuneate, carpels ½-circular ; seeds orbicular, ⅔–1¼ in. diam , wing very broad all round.

Low country ; very common. Fl. Aug., Sept. ; pale-greenish.
Also in India and Burma.
Roots eaten in times of famine.

4. **D. intermedia,** *Thw. Enum.* 326 (1864). C. P. 2870, 3022.
Fl. B. Ind. vi. 297.

Root-tubers unknown ; stem very slender, terete, unarmed, quite glabrous, not tuberiferous ; l. opp., rarely alt., 3–4 by 2 in., from linear-lanceolate to oval or oblong, acuminate, mucronate or caudate, glabrous on both surfaces, 3-veined, base cuneate, rounded, truncate or cordate, margin with a very slender cartilaginous margin, petiole ½–1 in. ; male spikes 1–1½ in., very slender, in axillary clusters, or clustered or whorled on a filiform, glabrous, flexuous rhachis ; fl. $\frac{1}{20}$ in. broad, sessile by a broad base, bract minute ; perianth.-segm. nearly orbicular ; stam. 6, fil. very short, anth. didymous ; pistillode obscure ; fem. fl. not seen ; fr. 1–1¼ in. diam., transversely oblong, base cuneate, tip retuse, carpels ½-circular ; seeds broadly winged all round.

Low country, especially in intermediate region ; rather common. Kukul Korale (Thwaites) ; Haragama ; Mehamahanuwara ; between Negombo and Kurunegala ; Puttalam. Fl. July, December ; greenish-yellow.
Endemic.

I doubt this being anything but a state of *D. oppositifolia* with glabrous inflorescence. One sheet of Thwaites, C. P. 3022 in Herb. Peraden., has very narrow l. 2–3 by ½–¼ in., gradually narrowed to the tip, rounded or retuse at the base, and petiole ¼ in. It looks very different from others under the same number, and from 2870. It is in fruit only.—J. D. H.

5. **D. spicata,** *Roth, Nov. Sp. Pl.* 371 (1821). **Gon-ala,** *S.* [PLATE XCIII.]
Thw. Enum. 326 (var. *a* only). C. P. 2871.
Fl. B. Ind. vi. 291.

Root-tubers 2–3 ft. long by 2½ in. diam. or more, pale brown ; stem very long, up to 20 ft. very slender, sparingly prickly, glabrous, green, mottled with brown, not tuberiferous ; l. alt., 2–10 in. long, polymorphous, from linear-oblong or -lanceolate to oval, obovate, or orbicular, acute, acuminate,

cuspidate, or caudate, 3–5- rarely 7-veined, base cuneate or rounded, rarely subcordate, with a deep or shallow open sinus, glabrous and shining on both surfaces, finely reticulate beneath, margin very narrowly cartilaginous, petiole $\frac{3}{4}$–1 in., stout, often prehensile; male spikes 3–8 in. long, axillary, solitary or clustered, very slender, quite glabrous, rarely branched; fl. sessile, $\frac{1}{20}$–$\frac{1}{12}$ in. diam., solitary, distant, rarely 2–3 nate; bract broadly ovate, acuminate, much smaller than the fl.; perianth-segm. broadly ovate, tips rounded; stam. 6, fil. stout, anth. large, didymous; pistillode conical, 3-lobed; fem. fl. distant, in solitary, axillary, pendulous spikes, 6–12 in. long, glabrous; ov. glabrous, with a minute, ovate bract at the base; perianth.-segm. orbicular; staminodes 6, minute; stigmas short, linear, spreading; fr. transversely oblong, $1\frac{1}{2}$–2 in. diam., retuse at both ends coriaceous, carpels $\frac{1}{2}$-circular, or broader than long; seeds broadly winged all round.

Moist region up to 4000 ft.; common. Fl. Sept.–Jan.; greenish.
Also in India.
Dr. Trimen has a note to the effect that Thwaites's var. β, Enum. l. c. (C. P. 2872, 3119) is quite different, but I fail to distinguish it. Thwaites's sole character is 'l. rounded, cordate, or even deeply cordate at the base' in contradistinction to *α*, in which they are acute; but I find the l. of *D. spicata* to be too protean to enable me to found varieties upon them.

6. **D. sativa,** *Linn. Sp. Pl.* 1033 (1753). **Panu-kondol,** *S.*
Thw. Enum. 326 in note. *D. bulbifera*, Br. Thw. l. c. (non Linn.). Moon, Cat. n. 69. C. P. 2997.
Herm, Par. Bot. 217; Mus. 46. Burm. Thes. 207. Fl. Zeyl. 358.
Fl. Brit. Ind. vi. 295. Linn. Hort. Cliff. t. 28. Wight, Ic. t. 878 (*D. bulbifera*).

Root-tubers very large, globose or elongate; stem terete, unarmed, glabrous, tuberiferous in the l. axils; l. opp. and alt., 3–14 in. long and broad, broadly ovate-cordate, sometimes broader than long, acuminate cuspidate or caudate, 7–9-veined, glabrous, membranous, basal sinus broad, deep or shallow, petiole 2–6 in.; male spikes 1–4 in., filiform, crowded or scattered on the branches of crowded axillary slender pendulous glabrous spikes or panicles up to 12 in. long, green or purplish; fl. solitary, sessile by a broad base, bracts ovate, acuminate; perianth-segm. subvalvate, fleshy, outer $\frac{1}{10}$ in. long, lanceolate, inner rather smaller and narrower; stam. 6, fil. much shorter than the segm., anth. minute, didymous; pistillode 3-lobed; fem. spikes axillary, solitary or fascicled, 4–10 in. long, pendulous; fl. sessile, $\frac{1}{8}$ in. long, glabrous; perianth-segm. as in the male; staminodes 6; ov. with 2 minute, ovate, acuminate bracts at the base, style short, conical, stigmas 3, very short, recurved; fr. $\frac{2}{3}$–1 in. long, by

$\frac{1}{3}$–$\frac{1}{2}$ in. broad, quadrately oblong, rather broader upwards, top truncate or abruptly acute, base truncate or subcordate; seeds winged at the lower end only, wing twice as long as the nucleus.

Low country to 2000 ft.; very common. Fl. Aug., Sept.; yellowish white.

Throughout India, wild and cultivated.

Roots, according to Thwaites, employed to attract fish to certain spots where they can be easily caught. For this purpose, pieces are daily, for some time, thrown into the water. I have cited Hermann, Burmann, and Linn. Fl. Zeyl. from *D. sativa*, but the fruit not being figured or described in these works renders their identification doubtful. Thwaites, in a note, mentions *D. sativa*, L., as a cultivated plant in Ceylon, with the name kattoo-kookoolala (katu-kukalala, *Trimen*), supposing it to be a different species from his *D. bulbifera.* As Dr. Trimen, in a note upon his and Thwaites's *bulbifera*, says that the roots are not eaten, it would appear that this may be the wild uneatable state of the cultivated plant. The attention of Ceylon botanists should be given to this subject.—J. D. H.

D. bulbifera, Linn. Sp. Pl. 1033. In a note by Dr. Trimen on this species, he says: 'I do not understand why this very common and well-known species is considered unrecognisable and undeterminable in Fl. Brit. Ind.' Dr. Trimen has overlooked Bentham's observation in Fl. Hong Kong, p. 368, and Fl. Austral. vi. 462, that modern authors have transposed the Linnæan names of the two species, *D. sativa* and *D. bulbifera.* Had he referred to the figure in Rheede (vii. t. 36), which he cites under his (and Thwaites's) *bulbifera*, and which is the only recognisable authority for that plant cited by Linnæus, he would have seen that it could not be the plant so named in the 'Enumeratio,' and in both the Herbarium and drawings at Peradeniya. The latter has the oblong fr. with narrow carpels of *D. sativa*, L., well figured in the Hortus Criffortianus, whereas Rheede's plant, cited by Linnæus for his *D. bulbifera*, has a broad fr. with $\frac{1}{2}$-circular carpels. The latter may represent an unarmed specimen of *D. spinosa*, Roxb., if that plant ever bears tubers on the stem.—J. D. H.

D. obcuneata, Hook, f. Fl. Brit. Ind. vi. 293 (1892). A single specimen in Herb. Kew, ticketed by Sir. W. Hooker as from Ceylon, without collector's name or date, is all that is known of this. It may be recognised by the exceedingly slender terete branches, simple opposite, cuneately obovate, cuspidate, 3-veined thin l., and capillary spikes of most minute globose male fl.; fem. fl. and fr. unknown.—J. D. H.

Three other species of *Dioscorea* are cultivated in Ceylon, and there are specimens of the first two in the Peradeniya Herbarium. They are *D. alata*, L. (kiri kunul), with winged stems and branches; *D. spinosa*, Roxb., with very spinous stems towards the base; and *D. purpurea*, Roxb. (kahata kundol), with purple tubers and winged or angled stems.

2. **TRICHOPUS,** *Gaertn.*

A small, erect, rigid, glabrous, perennial, 1-leaved herb; stem very short, tufted, rooting at the base, angular; roots wiry; l. terminal on the stem, petioled, very variable, rigid, 5–9-costate; stip. ovate-lanceolate, persistent; fl. small, fas-

cicled at the base of the l., bisexual, pedicels filiform; bracts lanceolate, acute; perianth campanulate, subequally 6-cleft, segm. subequal, biseriate, persistent; stam. 6, inserted on the base of the perianth-lobes; anth. subsessile, short, broad, connective produced into a lanceolate appendage, cells rather distant, parallel; ov. 3-celled, cells with 2 superposed ovules, style very short, stigmas 3, short, bifid, reflexed; fr. obovoid, trigonous, indehiscent, pericarp thick; seeds oblong, rugose, dorsally grooved, testa thin, embryo minute in cartilaginous endosperm.—Monotypic.

Lindley placed this genus in *Aristolochiaceæ*. It is very anomalous.

T. zeylanicus, *Gaertn. Fruct.* i. 44 (1788). **Bim-pol,** *S.*
Trichopodium zeylanicum, Thw. Enum. 291. *T. cordatum*, *T. intermedium*, and *T. angustifolium*, Lindl. in Bot. Reg. xviii. sub t. 1543. C P. 467.
Fl. B. Ind. vi. 297. Bedd. Ic. Pl. Ind. Or. t. 290. Bot. Mag. t. 7350.

Stem 1–8 in., wiry, flexuous, trigonous, green; l. 2–8 in., from linear-lanceolate to oblong, ovate, or triangular; base cuneate, rounded, retuse, or deeply cordate, with an acute sinus, and rounded or oblong lobes, veins deeply sunk above, prominent beneath, with few strong, transverse venules, petiole like a continuation of the stem; pedicels 1–3 in., pendulous, spreading, flexuous; fl. $\frac{1}{4}$–$\frac{1}{2}$ in. broad, nodding; perianth-tube small, campanulate, segm. ovate-lanceolate, spreading; fil. very short, anth.-cells diverging below, connective produced at the apex into a lanceolate appendage longer than the cells, and into a short 2-fid process at the base; stigmas large, 2-lobed, closely appressed together, lobes pyriform; fr. $\frac{1}{2}$–1 in. long, trigonously pyriform in outline, tip narrowed, base contracted into the thickened pedicel, wings thick.

Low country in damp sandy places; rather common. Fl. March, July; dark brownish-purple.

Also in Travancore, and Pahang in the Malay Peninsula. Gaertner's specimens were from Ceylon, and probably collected by Hermann.

CXXXII.—ROXBURGHIACEÆ.

ROOTSTOCK tuberous; stem perennial, twining, slender, branching; l. alt. or whorled, simple, petioled, 3–9-veined at the base, with very close cross-venules; fl. in axillary, few-fld. ped, or solitary; perianth inferior, 4-partite, segm. biseriate, lanceolate, spreading and recurved, grooved down

the centre; stam. 4, inserted on the bases of the perianth-segm., fil. very short, anth. linear, erect, connective produced into a lanceolate erect appendage, cells parallel; ov. short, ovoid, compressed, 1-celled, stigma sessile, pointed, ovules few, basal, erect, anatropous; fr. 2-valved, coriaceous; seeds few, oblong, grooved, beaked, testa coriaceous, funicle fleshy, crinitely lobed; embryo small in the centre of dense, fleshy endosperm.

STEMONA, *Lour.*

For characters, see Order.—Sp. 4 or 5; 4 in *Fl. B. Ind.*

S. minor, *Hk. f. in Fl. B. Ind.* vi. 298 (1892).
Roxburghia gloriosoides, var. *minor*, Thw. Enum. 432. *Stemona tuberosa*, Lour., var. *minor*, Trim. Syst. Cat. 94. C. P. 3775.
Fl. B. Ind. vi. 298. Wight, Ic. t. 2061 (*R. gloriosoides*).

Tubers many, cylindric, fleshy; stem climbing trees, terete, smooth; l. alt., 1½–3 in., ovate, or ovate-cordate, narrowed from the broad base to the caudate-acuminate tip, membranous, smooth and shining on both surfaces, petiole 1–1½ in., very slender; pedicel very short; perianth-segm. ¾ in. long, narrowly linear-lanceolate; stam. ½ in. long; fr. ½ in. long, oblong, beaked, terete, smooth; seeds ⅓ in. long.

Dry country; very rare. I have only the C. P. specimens from Trincomalie (Glenie, 1862). Fl. Sept. (March; greenish-white, with green veins, anth. purple).

Also in S. India (Malabar).

Regarded by Trimen in his Syst. Cat. as a variety of *R. gloriosoides*, but retained as *S. minor* in his final list of species prepared for the Handbook.

CXXXIII.—LILIACEÆ.

Herbs, rarely shrubs, with simple fibrous or tuberous roots, or with creeping rootstocks, bulbs, or corms; l. various, simple; infl. various, fl. bi- rarely uni-sexual; perianth petaloid, 6-merous in 2 series, lobes or segm. free or connate below, imbricate or rarely valvate in bud; stam. 6, rarely fewer, inserted on the perianth, fil. free or connate, anth. linear or oblong; ov. 3-celled, cells 2- or more-ovuled, style simple, rarely 0 or 3, ovules anatropous or orthotropous; fr. a 3-celled berry or a capsule; seeds globose or flattened, testa various, embryo long or short, terete, endosperm horny or fleshy.

Aloe vera, L., var. *littoralis*, Kœn. (non *A. littoralis*, Baker), is an extremely abundant plant on the seashore of the northern coast, growing with *Opuntia Dillenii*, &c. It is called *Kattalai*, T. Kœnig, in 1781, in his MSS. (in Mus. Brit.), describes it as very common at Mannar,

Kalpitiya, and other places, and there are specimens from him (see Bentl. and Trim. Med. Pl. iv. 282). The native country of *A. vera* seems to be N. Africa and the desert regions of Arabia, &c. No species of *Aloe* is included in Fl. B. Ind., it is therefore not considered wild either in N. W. India, where it (*A. indica*, Royle) is common, or here. Our variety has short leaves, and a perfectly simple spicate raceme with red flowers. In my Syst. Cat. (p. 94) I have included it as a native, and it is not impossible that it may, like so many plants of the desert region, find its limit on our N.W. coast; but I doubt if it seeds here.—*Trimen.*

Polianthes tuberosa, Linn. (Herm. Mus. 35. Burm. Thes. 122. Fl. Zeyl. 125.) The Tuberose, a Mexican plant, is cultivated in gardens only.

Fruit a berry.
  Ovules orthotropous.
    Climbers, l. broad . . . . 1. SMILAX.
    Climbers, with narrow cladodes . . . . 2. ASPARAGUS.
  Ovules anatropous
    Shrub . . . . 3. DRACÆNA.
    Herbs.
      L. narrow, distichous . . . . . . 4. DIANELLA.
      L. broad . . . . 5. DISPORUM.
Fr. capsular.
  Root of fleshy fibres . . . . 6. CHLOROPHYTUM.
    Rootstock bulbous.
      Fl. umbellate . . . . . 7. ALLIUM.
      Fl. racemose.
        Perianth tubular . . . . 8. DIPCADI.
        Perianth 6-partite.
          Seeds winged . . . . . . 9. URGINEA.
          Seeds not winged . . . . . . 10. SCILLA.
  Rootstock a corm.
    Erect herb, l. linear . . . . 11. IPHIGENIA.
    Climbing undershrub, l. ovate . . . . . 12. GLORIOSA.

1. **SMILAX**, *Linn.*

Climbing or rambling evergreen shrubs (the Ceylon sp.); l. alt., simple, persistent, 3–9-veined, venules reticulate, petiole sheathing at the base, sheath often 2-cirrhiferous; infl. umbellate, fl. dioecious, small, ped. bracteate, pedicels bracteolate; perianth inferior, segm. 6, free, incurved or recurved; male fl.:—stam. 6, inserted on the base of the perianth; fil. free, anth. didymous or oblong; pistillode small, or 0; fem. fl.:—staminodes 3 or 6; ov. trigonous, 3-celled, cells 1–2-ovuled, style short, or 0; stigmas 3, recurved, ovules orthotropous, pendulous; fr. a globose berry; seeds solitary, globose, or 2–3 hemispheric or angular, smooth, embryo small, in horny endosperm.—Sp. about 120; 33 in *Fl. B. Ind.*

Umbels in short axillary spikes . . . . . . 1. A. ASPERA.
Umbels solitary, or 2–3 on a common peduncle . 2. A. ZEYLANICA.
Umbels many, racemose or panicled . . . . 3. A. PROLIFERA.

1. **S. aspera,** *Linn. Sp. Pl.* 1028 (1753).

S. maculata, Roxb., Thw. Enum. 338. Trim. Syst. Cat. 94. C. P. 75. Fl. B. Ind. vi. 306. Wight, Ic. t. 2059 (*S. maculata*).

A scandent, glabrous, much-branched, more or less prickly shrub, branches angular; l. 1½–3 in., ovate, deltoid or lanceolate, rarely orbicular, acute or acuminate, jointed on the petiole, or cordate with rounded lobes, 5–9-veined, often blotched with white, base truncate or hastate, petiole ½–⅔ in. and veins beneath smooth or prickly, sheath with long or short tendrils; spike 2–6 in., rhachis zigzag, smooth; umbels sessile, few- or many-fld., bracts alternate, ovate, acute, bracteoles minute, pedicels shorter than the fl. buds; male fl. about ¼ in. broad, sep. linear-oblong; pet. rather narrower; anth. linear, shorter than the fil.; fem. fl. smaller, sep. and pet. broader; staminodes 6, stigmas sessile, oblong, recurved; berries pisiform, ¼–⅓ in. diam., red.

Montane zone up to 7000 ft.; common. Fl. April; pinkish-yellow, fragrant.

Throughout India, and westward, to the Mediterranean region.

2. **S. zeylanica,** *L. Sp. Pl.* 1029 (1753). **Kabarasa, Hin-kabarasa,** *S.*

Herm. Mus. 22. Burm. Thes. 217. Fl. Zeyl. n. 364. Moon, Cat. 69. Thw. Enum. 338. C. P. 3670.

Fl. B. Ind. vi. 309. Rheede, Hort. Mal. vii. t. 31.

A scandent, glabrous, unarmed, or sparingly prickly shrub, branches slender, flexuous, angular; l. 3–4 by 1½–2½ in., oval, broadly oblong or orbicular, tip rounded obtuse or obtusely cuspidate, upper sometimes acute, base rounded or cordate, 3–5-veined, coriaceous, margins cartilaginous; petiole ½–1 in., jointed at the middle, base narrowly sheathing, cirrhiferous; umbels about 1 in. diam., globose, solitary, or 2–3 on a terminal rhachis, 10–30-fld., ped. short, pedicel ¼–⅓ in., bracts and bracteoles minute, buds obovoid or oblong; fl. about ½ in. broad; male perianth-segm. linear; stam. as long as the sep., anth. oblong, much shorter than the fil.; fem. perianth-segm. ovate-oblong, obtuse; staminodes 6; stigma linear, obtuse, at length revolute; berries subglobose, usually 2-seeded; seeds plano-convex.

Moist region up to 5000 ft.; common. Fl. Sept.; pale green.

Also in India, Burma, and Malaya.

Thw. quotes Wight, Ic. tt. 2057, 8, for this; but A. DC. in his monograph, p. 174, refers these figures to his *S. Wightii*.

3. **S. prolifera,** *Roxb. Fl. Ind.* iii. 795 (1832). **Mahakabarasa,** *S.*

S. latifolia, Moon, Cat. 69. *S. ovalifolia*, Thw. Enum. 338 (non Roxb.). C. P. 2302.

Fl. B. Ind. vi. 312.

Stem stout, climbing, terete, armed with strong prickles; l. variable, 4–8 by 1½–6 in., from oblong to ovate or orbicular-ovate, acuminate, or obtuse and cuspidate, very coriaceous, 3–7-veined from above the rounded or subcordate base, margins hardly thickened, petiole 1–2 in., jointed above the middle, sheath amplexicaul, biauricled, broad or narrow, cirrhiferous or not; racemes 4–6 in., bearing many alternate ternate or whorled 30–40-fld. peduncled umbels, bracts and bracteoles minute, pedicels ¼–½ in.; buds narrowly oblong, obtuse; perianth-segm. ⅕ in. long, linear, revolute; stam. as long as the segm.; anth. linear-oblong, much shorter than the slender fil.; fem. perianth-segm. ovate-oblong, obtuse, inner linear from an ovate base, both often breaking transversely above the base; staminodes 3 or 6; ov. oblong, stigmas large, linear, erect, caducous; berry pisiform, red; seeds small, biconvex.

Moist region to 3000 ft.; rather common. Fl. pale green.
Also in India and Burma.

2. ASPARAGUS, *L.*

Rootstock stout, creeping; stem simple or branched, erect, rambling or climbing, terete, grooved, or angled, unarmed or prickly; l. reduced to minute scales, sometimes spinescent, bearing in their axils tufts of slender, trigonous, or flattened branchlets (cladodes); fl. small or minute, axillary, solitary, fascicled, or racemed, white, marcescent, pedicels jointed; perianth campanulate or rotate, 6-partite; stam. inserted on the segm., anth. dorsifixed, oblong; ov. trigonous, 3-celled, cells 2- or more-ovuled, style short, stigmas 3, minute, ovules orthotropous; berry globose, 1-few-seeded; seeds subglobose, testa thin, black, closely adherent to the horny endosperm, embryo slender, cylindric, straight or curved.—Sp. about 100; 17 in *Fl. B. Ind.*

The available materials in Herb. Peraden. and Kew are insufficient to enable me to draw up satisfactory descriptions of the Ceylon species of *Asparagus.* I am especially in doubt as to the value of the characters afforded by the position of the joints on the pedicel of the fl., the size of the perianth, and breadth of its segments. The C. P. numbers, Sp. 1, 2, and 4, are mixed in Peradeniya and other herbs.—J. D. H.

Cladodes trigonous or triquetrous.
 Fl. $\frac{1}{12}$–⅛ in. diam. . . . . 1. A. RACEMOSUS.
 Fl. ¼ in diam. . . . . 2. A. ZEYLANICUS.
Cladodes flattened.
 Clad. 4–6 in. long . . . . 3. A. FALCATUS.
 Clad. 1–1½ in. long . . . . 4. A. GONOCLADOS.

1. **A. racemosus,** *Willd. Sp. Pl.* ii. 152 (1799). **Chattavari,** *T.* **Hatawariya,** *S.*

Thw. Enum. 337. *A. sarmentosus*, Thw. l. c. part (non L.). C. P. 2300 (part), and 2299 (part), 705 (part).

Fl. B. Ind. vi. 316. Wight, Ic. t. 2056.

A tall, rambling and scandent, spinous, excessively branched undershrub, rootstock tuberous, branches triquetrous, spines $\frac{1}{4}$–$\frac{1}{2}$ in., straight or subrecurved; cladodes 2–6-nate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{40}$ in. broad in the middle, acicular, trigonous, falcate, finely acuminate at both ends; racemes 1–2 in., many-fld., solitary or fascicled, simple, rarely branched; pedicels very slender, $\frac{1}{6}$ in., jointed at or above the middle; perianth $\frac{1}{12}$–$\frac{1}{8}$ in. across, segm. oblong, obtuse; anth. small, shortly oblong, purplish; ov. cells 6-ovuled; berry 1–2-seeded, globose or didymous, $\frac{1}{6}$–$\frac{1}{4}$ in. diam.

Low country, mostly in the dry region; common. Trincomalie (Glenie); Bintenne (Thwaites); Puttalam; Jaffna; Mihintale, &c.

Fl. Feb., &c.; white, fragrant.

Very variable in length of leaves and spines. In Herb. Peraden., under C. P. 2299, there are, on the same sheet, flowering specimens of *A. gonoclados*, with the pedicels jointed towards the base, and fruiting specimens of *racemosus* with stems jointed in the middle. In the specimens numbered C. P. 705 and 2300 they are jointed above the middle.—J. D. H.

2. **A. zeylanicus,** *Hk. f. in Fl. B. Ind.* vi. 317 (1892).

A. sarmentosus, Thw. Enum. 337 (non L.). *A. racemosus*, var. *zeylanicus*, Baker in Journ. Linn. Soc. xiv. 263; Trim. Syst. Cat. 94. C. P. 2300 (part).

Characters of *A. racemosus*, but l. more thickened in the middle, up to $\frac{1}{30}$ in. diam., fl. larger, up to $\frac{1}{4}$ in. diam., and anth. much larger; the pedicels are jointed in the middle.

Moist region, especially in the montane zone, reaching to 7500 ft.; common. Fl. April, Nov.; white.

The Fl. B. Ind. gives C. P. 2299 for this; in Herb. Perad. that number is made up of *A. racemosus* and *A. gonoclados*. But C. P. 2299 and 2300 were made by the division of the old number, C. P. 737, and are much mixed.—*Trimen.*

After examining the Herb. Peraden. specimens, I doubt this being more than a variety of *A. racemosus*, as Baker originally determined. Trimen had so considered it in his Syst. Cat., but in his list of species prepared for this Handbook it is kept up. Thwaites also considered it distinct, and referred it to *A. sarmentosus*, L. (see end of genus). According to Trimen, it inhabits a much higher level than *A. racemosus*. It has also a larger perianth and stamens.—J. D. H.

3. **A. falcatus,** *L. Sp. Pl.* 314 (1753). **Hatawariya,** *S.*

Herm. Mus. 2. Burm. Thes. 36. Fl. Zeyl. n. 123. Moon, Cat. 25. Thw. Enum. 337. C. P. 2298.

Fl. B. Ind. vi. 318. Burm. Thes. t. xiii. f. 2.

Stem tall, subscandent, and branches terete, smooth, armed, branchlets very slender, flexuous, spines $\frac{1}{6}$–$\frac{1}{4}$ in.; cladodes solitary and 2–6 nate, 4–6 in. long by $\frac{1}{12}$–$\frac{1}{6}$ in. broad, narrowly ensiform, falcate, flat, costate, narrowed into the acicular tip; racemes $\frac{1}{2}$–$\frac{3}{4}$ in., often subcorymbiform, laxly few-fld., rhachis filiform, bracts minute, cymbiform, pedicels $\frac{1}{12}$–$\frac{1}{6}$ in., capillary, jointed below the middle; perianth $\frac{1}{12}$ in. diam., segm. oblong, obtuse; anth. minute, subglobose; berry $\frac{1}{4}$ in. diam., 1–3-seeded.

Moist and intermediate region up to 4000 ft.; common. Fl. Sept., Oct.; white, sweet-scented.

Young shoots eaten.

4. **A. gonocládos,** *Baker in Journ. Linn. Soc.* xiv. 627 (1875). Trim. Syst. Cat. 94. C. P. 2299 (part) (737 in Herb. Kew). Fl. B. Ind. vi. 318.

An excessively branched, subscandent, armed undershrub; stem terete, branches curved, green, triquetrous; spines short; cladodes 2–6-nate, 1–1$\frac{1}{2}$ in. long by $\frac{1}{15}$ in. broad, flat, straight, or falcate, subcostate, narrowed to the acuminate base and tip; racemes 1–3 in., often fascicled, sometimes connate, pedicels $\frac{1}{20}$–$\frac{1}{12}$ in., jointed much below the middle, bracts as long as the lower joint of the pedicel, cymbiform; perianth $\frac{1}{12}$–$\frac{1}{10}$ in. across, segm. spreading, outer linear-oblong, inner more spathulate; anth. much shorter than the fil.; berry globose, $\frac{1}{6}$ in. diam., or didymous and twice as broad.

Moist region; not uncommon in the low country. Kandy; Hantane; Peradeniya; Doluwe Kande, &c. Fl. white.

Also in S. India.

Baker describes the pedicels as jointed in the middle, and so they are in Nilgiri, Kurg, and Concan specimens; but in all the Ceylon ones they are jointed towards the base. There are, in Herb. Peraden., specimens of a plant collected by Dr. Trimen in the mountains of the N.E. Block (Knuckles Mt. and Nitre Cave districts), and doubtfully considered by him to be a new species. These differ somewhat from typical *A. gonoclados* in having rather broader cladodes ($\frac{1}{10}$–$\frac{1}{7}$ in.,) shorter perianth-lobes and filaments. They are undistinguishable from specimens of *A. æthiopicus*, L., var. β, Baker (Flor. Capens. vi. 272), a native of Natal. On showing them to Mr. Baker (who has studied the whole genus), he expressed himself disposed to doubt *A. gonoclados* being specifically distinct from *A. æthiopicus.*—J. D. H.

A. sarmentosus, L., is figured in Herm. Hort. Lugd.-Bat. tt. 63 and 650, with a full description, and is Fl. Zeyl. n. 124; but there is no specimen in Hermann's Herb. It appears to be either *A. gonoclados* or a small-leaved *A. falcatus.* Kœnig's Ceylon specimens in Mus. Brit. labelled *A. sarmentosus* are *A. racemosus.* The name has unfortunately been transferred to a Cape species by modern botanists, with which it can have nothing to do (see Journ. Linn. Soc. xxiv. 139).—*Trimen.*

3. **DRACÆNA,** *Linn.*

Trees or shrubs, sometimes dwarf with prostrate stems; l. alt., crowded at the ends of the trunk or branches, petioled, lanceolate; fl. in terminal panicles, white, bracts small; perianth superior, tubular, 6-cleft, lobes spreading and recurved; stam. 6, inserted at the base of the per.-tube or of its lobes, fil. elongate, anth. versatile; ov. 3-celled, cells 1-ovuled, style filiform, stigma capitate, ovules erect, anatropous; berry globose or 2–3-dymous, seeds globose or angled, testa coriaceous, embryo small in horny endosperm.—Sp. about 35; 15 in *Fl. B. Ind.*

Cordyline terminalis, Kunth (*D. terminalis*, Moon), a tall *Dracæna*-like plant, common in India and the East, is frequently grown in Ceylon gardens, &c.

D. Thwaitesii, *Regel in Act. Hort. Petrop.* i. 144 (1871).
D. elliptica, Thunb. Diss. 6 (1808) (in part); Thw. Enum. 338. Baker in Journ. Linn. Soc. xiv. 533. C. P. 2293.
Fl. B. Ind. vi. 329 (*D. terniflora*, Roxb., var. (?) *Thwaitesii*). Wight, Ic. t. 2054 (*Dracæna terminalis*).

Roots long, unbranched, rather stout; stem $1\frac{1}{2}$–$2\frac{1}{2}$ ft., erect, stout, sparingly branched, woody and naked below; l. rather crowded in the upper part of the stem, alt., 7–9 in., narrowly oblong-lanceolate, acuminate with a filiform point, pale green on both surfaces; costa distinct, veins very close, slender, petiole rather long, base sheathing; infl. a terminal narrow panicle, 2–4 in. long; ped. very short, stout; bracteoles ovate, acuminate, half as long as the short stout pedicels; perianth-tube $\frac{1}{6}$ in. long, lobes as long, linear-oblong, obtuse; fil. half as long as the lobes, anth. linear-oblong; fr. 2–3-dymous, carpels pisiform.

Moist region in forests up to 4000 ft.; rather common. Fl. May; pale green or yellowish, berries bright orange-coloured, translucent.

Also in Travancore.

In Fl. Brit. Ind. I have referred this doubtfully, as a variety, to the widely distributed Indian *D. terniflora;* as, however, Dr. Trimen considered it to be distinct from that plant, probably rightly (he is supported by Regel and Baker, and has seen living specimens), I follow suit. I think it is certainly the same as a Courtallam plant collected by Wight, which he took for *Cordyline terminalis*, and figured as such. Wight gives Courtallam and Quilon as habitats, adding, 'perhaps in both instances the outcast of gardens.' I suspect that Wight was misled by the belief that he was dealing with the common cultivated Malayan *Cordyline terminalis* into suspecting that *D. Thwaitesii* was an introduced plant. There are Courtallam specimens in Wight's Herb., but no Quilon ones. The shortness of the perianth is its best character.—J. D. H.

4. **DIANELLA,** *Lam.*

Rootstock branching, stoloniferous; stem erect, clothed with leaf-sheaths; l. elongate, rigid, distichous, sheaths equitant; fl. in an erect, rigid, long-peduncled, cymose, nodding, panicle, pedicels jointed at the top, bracts small; perianth rotate, 6-partite, segm. subequal, oblong, spreading, strongly veined, marcescent; stam. 6, 3 hypogynous, 3 inserted on the bases of the segm., fil. short, greatly thickened above, anth. linear-oblong, dorsifixed, dehiscing by apical slits; ov. 3-celled, cells 4–8-ovuled, style filiform, stigma minute, ovules anatropous; berries blue, few-seeded, testa black, shining, embryo linear, in fleshy endosperm.—Sp. 7 or 8; 1 in *Fl. B. Ind.*

D. ensifolia, *Redouté Lil.* i. t. 1 (1802). **Monara-petan,** *S.*
Moon, Cat. 25. Thw. Enum. 338. C. P. 3212.
Fl. B. Ind. vi. 337. Bot. Mag. t. 1404 (poor). Wight, Ic. t. 2053.

Rootstock short, with fibrous roots; stem 3–6 ft., as thick as a swan's quill, compressed, rigid, leafy; l. 1–2 ft. by $\frac{3}{4}$–1 in., rigid, linear-lanceolate, acuminate, keeled, costate, dark green, margins and sometimes keel minutely aculeolate, sheaths compressed, acutely keeled; ped. terminal, rigid, sheathed with 2 or 3 short l.; panicle 1–2 ft., branches flexuous, flowering towards the tips; bracts small, ovate-lanceolate, pedicels $\frac{1}{4}$–$\frac{1}{2}$ in., curved; perianth $\frac{1}{2}$ in. broad, segm. oblong-oval, apiculate; fil. much shorter than the anth., suddenly dilated in the upper half into a broad yellow incurved limb, on which the long much narrower anth. appears to rest, anth.-cells very narrow, tips acuminate; berry $\frac{1}{3}$–$\frac{1}{2}$ in. diam, blue; seeds ovoid, shortly beaked.

Moist region 1–4000 ft.; common. Fl. April; pale blue.
Also in Trop. Asia, Australia, and Pacific Is., and in Mauritius.

5. **DISPORUM,** *Salisb.*

Rootstock creeping; stem erect, dichotomously branching, angular, leafy; l. alt., very shortly petioled, oval or ovate, strongly nerved, petiole not sheathing; fl. terminal or axillary, solitary, or in few-fld. subumbellate fascicles, cernuous, pedicels stout, decurved; perianth campanulate, segm. 6, erect, deciduous, costate; stam. 6, hypogynous, included, fil. short, anth oblong, dorsifixed, slits extrorse; ov. obovoid, 3-celled, cells 2–6-ovuled, style columnar, stigmas 3, recurved or revolute, ovules anatropous; berry globose, few-seeded; seeds subglobose, testa appressed, brown, embryo minute, in horny endosperm.—Sp. 8 or 10; 3 in *Fl. B. Ind.*

D. Leschenaultianum, *D. Don in Trans. Linn. Soc.* xviii. 518 (1841).
D. zeylanicum, Wight, Ic. vi. 26. Thw. Enum. 338. C. P. 2319.
Fl. B. Ind. vi. 360. Wight, Ic. tt. 2048, 2049 (*D. ceylanicum* and *mysorense*). Bot. Mag. t. 6935.

Stem 1–2 ft., acutely angled, simple below, and clothed with broad sheathing scales, dichotomously branched above; l. 1–4 by 1–2 in., orbicular, oblong, oval or oblong-lanceolate, acute, acuminate, cuspidate, or almost caudate, strongly 5-veined, plicate between the veins, cross venules distinct; perianth subcampanulate, $\frac{1}{2}$–$\frac{3}{4}$ in. across the mouth, segm. oblong to linear-oblong, obtuse or subacute, base hardly saccate, rather thick, dorsally obtusely keeled; fil. stout, about as long as the anth., but very variable; berry $\frac{3}{4}$ in. diam., depressed-globose, dark blue; seeds globose.

Montane zone in open places in forests; common. Fl. May–Sept.; white.
Also in S. Indian Mts.

6. CHLOROPHYTUM, *Ker.*

Rootstock short, with fascicled, fleshy, or tuberous roots; l. radical, crowded, petioled, linear, or lanceolate; fl. racemose, on an erect, leafless, simple, or branched ped.; perianth rotate, 6-partite, segm. lanceolate or oblong, 3–7-veined; stam. 6, biseriate, hypogynous, or the inner series adnate to the bases of the segm., shorter than the per.-segments, anth. linear, erect, slits introrse, fil. inserted in a pore between the bases of the cells; ov. sessile, triquetrous, 3-celled, cells few- or many-ovuled, style filiform, stigma simple, ovules anatropous; fr. coriaceous, triquetrous, loculicidal; seeds compressed, rugose, testa black, embryo in the axis of hard endosperm.—Sp. about 40; 11 in *Fl. B. Ind.*

L. oblanceolate . . . . 1. C. HEYNEANUM.
L. linear . . . . 2. C. LAXUM.

1. **C. Heyneanum,** *Wall. Cat.* 5060 (1828).
Anthericum tuberosum, Moon, Cat. 25. *C. breviscapum,* Thw. Enum. 339 (non Dalz.). *C. Heynei,* Baker in Journ. Linn. Soc. xv. 322. C. P. 2291.
Fl. B. Ind. vi. 333.

Rootstock stout, cylindric, with several fleshy root-fibres; stem. very short; l. 6–12 by 1–2 in., spreading and recurved, oblanceolate, acuminate, narrowed into the petiole; petiole 2–6 in., deeply channelled, base hardly sheathing; infl. much shorter than the l., ped. $\frac{1}{2}$–3 in., stout, erect, raceme 3–5 in.,

dense-fld.; bracts longer than the fl., linear-lanceolate, acute, lower 1 in. long; pedicels $\frac{1}{6}$–$\frac{1}{4}$ in., erect, jointed near the top; perianth about $\frac{1}{2}$ in. broad, segm. narrowly lanceolate, tips cucullate, apiculate; anth. shorter than the fil.; cells of ov. about 15-ovuled; capsule $\frac{1}{3}$–$\frac{1}{2}$ in. long, erect, broadly oblong, shortly pedicelled, cells 8–10-seeded; seeds black, shining, minutely tubercled.

Low country; rather rare. Kurunegala and Matale (Gardner); Central Prov.; common (Thwaites). Fl. green.

Also in Peninsular India.

2. **C. laxum,** *Br. Prod.* 277 (1810).

C. parviflorum, Dalz., Thw. Enum. 339. *C. laxiflorum*, Baker in Journ. Linn. Soc. xv. 328. C. P. 2292.

Fl. B. Ind. vi. 336. Wight, Ic. t. 2039 (*Phalangium* (?) *parviflorum*).

Root-fibres slender or tuberous; l. 4–6 by $\frac{1}{4}$–$\frac{1}{2}$ in., subdistichous, usually spreading and strongly recurved, linear- or narrowly lanceolate, acuminate, flat or sides conduplicate, rather rigid, costate, green above, subglabrous beneath; ped. with the infl. as long as the l. or shorter, slender, flexuous, with scattered lanceolate bracts; fl. in distant bracteate fascicles an inch or more apart, appearing successively in each fascicle, bracts scarious, lanceolate, as long as the short decurved pedicels, which elongate in fr.; perianth $\frac{1}{6}$–$\frac{1}{4}$ in. broad, segm. ovate-oblong, acute; anth. green, didymous, much shorter than the fil.; capsule broadly obcordate, $\frac{1}{4}$ in. diam., cells 1–4-seeded; seeds globose, rough.

Moist low country; rather common. Fl. Dec., July, &c.; greenish-white.

Also in S. India, Borneo, China, Trop. Africa, Australia.

7. **ALLIUM,** *L.*

Fœtid (when bruised) scapigerous herbs, with tunicate bulbs; l. narrow; fl. umbelled, all at first enclosed in 2 membranous spathes; perianth rotate or campanulate, 6-partite, segm. persistent; stam. 6, inserted on the bases of the per.-segm., anth. slits introrse; ov. globose, 3-celled, cells one-ovuled, style filiform, stigma minute, ovules anatropous; capsule small, surrounded by the persistent perianth, loculicidal or bursting irregularly, one-seeded; seed globose or flattened, testa membranous, black, embryo cylindric in fleshy endosperm.—Sp. about 250; 27 in *Fl. B. Ind.*

The Ceylon *Allium* differs from the character of the genus in the usually indehiscent fr., with one large almost globose seed.—J. D. H.

A. Hookeri, *Thw. Enum. Pl. Zeyl.* 339 (1864).
Baker in Journ. Bot. xii. 292. *A. Wallichii*, Kunth, var., Regel, Mon. 146. C. P. 3659.
Fl. B. Ind. vi. 341.

Bulb small, with many long fibrous roots, outer coats at length fibrous, inner with long membranous sheaths up to 6 in. long, clasping the bases of the l.; l. 12–18 by $\frac{1}{8}$–$\frac{1}{3}$ in., narrowly linear, obtusely acuminate, rather fleshy, costate and 9–11-veined; scape 1–2 ft., subtrigonous; umbel globose, laxly many-fld., spathes caudate, pedicels $\frac{1}{2}$–2 in., filiform; perianth segm. $\frac{1}{3}$–$\frac{1}{2}$ in., narrowly linear from a broad base, acuminate; stam. rather shorter than the per-segm., subequal, anth. large; ov. globose, style not long, cells 1-ovuled; fr. an irregularly bursting thin-walled utricle or incompletely 3-valved capsule; seed solitary, globose or nearly so, testa granular, black, opaque.

Upper montane zone, in wet open places; rare. Pedurutalagala; Horton Plains, in several places; Hakgala Hill. Fl. August; greenish-white.
Khasia hills in E. Bengal.

8. **DIPCADI,** *Medic.*

Scapigerous herbs, with tunicate bulbs; l. narrowly linear; fl. racemose, on a simple naked scape, erect or spreading, bracteate; perianth deciduous, tube cylindric, 6-lobed, lobes biseriate, 3 outer spreading, 3 inner erect, conniving; stam. 6, inserted in the throat of the perianth, included, fil. short, anth. linear, dorsifixed, slits introrse; ov. sessile or stipitate, 3-celled, cells many-ovuled, style short, columnar, 3-furrowed, stigma 3-lobed, ovules anatropous; capsule tridymous, loculicidal, few or many-seeded; seeds compressed, testa black.—Sp. 27; 6 in *Fl. B. Ind.*

D. montanum, *Baker in Journ. Linn. Soc.* xi. 398 (1871).
Uropetalum montanum, Dalz., Thw. Enum. 443. C. P. 3856.
Fl. B. Ind. vi. 346 (not given for Ceylon).

Bulb not seen; l. 4–6 in., filiform, narrowed from the base to the tip, $\frac{1}{6}$ in. broad at the base, deeply grooved above, fleshy; scape 6–12 in., terete; raceme 6–12-fld., nodding; bracts lanceolate, $\frac{1}{6}$–$\frac{1}{2}$ in., acuminate, longer or shorter than the pedicels, scarious; perianth $\frac{1}{2}$–$\frac{3}{4}$ in. long, lobes as long as the subcampanulate tube, all with glandular tips; capsule stipitate, 3-lobed, cells 3–4-seeded.

Low country (?); very rare. Lakkaigala; Matala East, 1864 (Beckett).
Also in Peninsular India.

9. URGINEA, *Steinheil.*

Scapigerous herbs, with tunicate bulbs; l. narrow; scape naked; fl. racemed, jointed on the pedicels, bracteate; perianth subcampanulate, 6-partite, segm. subequal; stam. 6, inserted on the base of the segm., included, fil. filiform, anth. oblong, dorsifixed, slits introrse; ov. sessile, 3-celled, cells many-ovuled, style filiform, stigma thickened, ovules anatropous; capsule triquetrous, membranous, loculicidal; seeds compressed, winged, embryo terete in fleshy endosperm.—Sp. about 24; 5 in *Fl. B. Ind.*

U. rupicola, *Trim. Mss.*
U. congesta, var. *rupicola*, Trim. in Journ. Bot. xxvii. 167 (1889). Fl. B. Ind. vi. 348.

Bulb about 1 in. diam., broadly obpyriform, coats appressed, white; l. few, 5–6 in., almost filiform, channelled above, dorsally rounded, appearing with the flowers, but soon disappearing; scape 2–8 in., flexuous, naked; raceme 2–3 in., many- and lax-fld., rhachis very slender, bracts minute, deltoid, membranous; fl. subsecund, pedicels $\frac{1}{12}$–$\frac{1}{8}$ in., suberect; perianth segm. $\frac{1}{6}$ in. long, spreading, oblong, obtuse, membranous, 1-veined; fil. flattened below, broadly subulate, anth. as long, linear-oblong; capsule $\frac{1}{4}$ in. long, ellipsoid, obtuse at both ends, smooth; seeds $\frac{1}{5}$ in. long, oblong, flat, rounded at both ends, pale, nucleus narrow, broadly winged, wing hyaline.

Dry country; very rare. Rock-clefts at base of Dambulla Hill; Narangama below Lagalla. Fl. July, Aug.; white, with a brownish-pink line down each per.-segm.

Endemic.

In a note on this plant, Trimen says: 'This appears to be very near *U. congesta*, Wight (Ic. t. 2064), but the flowers are less numerous, laxer, and the perianth-segm. broader and more obtuse; the bracts, too, are of a different form from those figured, though agreeing with Wight's description.' To these characters may be added the slender rhachis of the raceme, longer pedicels of the fl., smaller capsule, and much smaller seeds, which are not black as in *U. congesta.*—J. D. H.

10. SCILLA, *Linn.*

Scapigerous herbs, with tunicate bulbs; l. broad or narrow, scape naked; fl. racemed, jointed on the pedicels; perianth campanulate, 6-partite, marcescent, segm. 2-seriate, subequal, recurved, 1-veined; stam. 6, inserted on the segm., included, fil. filiform, anth. oblong, dorsifixed, slits introrse; ov. stipitate, 3-celled, cells few-ovuled, style filiform, stigma capitellate,

ovules anatropous; capsule globose, 3-lobed, seated on the withered perianth, loculicidal, 1–few-seeded; testa black, embryo in fleshy endosperm.—Sp. about 80; 2 in *Fl. B. Ind.*

S. indica, *Baker in Saund. Ref. Bot.* iii. App. 12 (1870).
Ledebouria hyacinthina, Roth, Thw. Enum. 432. C. P. 2829.
Fl. B. Ind. vi. 348. Wight, Ic. tt. 2040 (*Ledeb. hyacinthina*) and 2041 (*Barnardia indica*). Bot. Mag. t. 3226.

Bulb ovoid or globose, 1–$1\frac{1}{2}$ in. diam.; l. few or many, spreading, and often rooting at the tips, 3–6 in. by $\frac{1}{2}$ in., variable, from oblong to lanceolate or oblanceolate, subacute, narrowed into a sheathing petiole, rather fleshy, waved, obtusely keeled, dull green above, and often blotched with black, pale and glaucous beneath; scape 2–6 in., rather stout, raceme cylindric, 30-50-fld., bracts minute, pedicels $\frac{1}{6}$–$\frac{1}{3}$ in., decurved, fl. pendulous or cernuous; perianth-segm. $\frac{1}{8}$ in. long, linear, acute; fil. as long as the perianth-segm., anth. small, shortly oblong; capsule 3-lobed, $\frac{1}{6}$ in. long and broad, membranous, cells 1–2-seeded; seeds cuneiform or clavate.

Dry region in sandy places, especially on the coast; rather rare. Trincomalie (Glenie); Puttalam (Nevill); Ratmale, E. Prov.; Kirinde, S. Prov. Fl. August; purplish or greenish-white.
Also in Peninsular India and Abyssinia.

11. IPHIGENIA, *Kunth.*

Erect herbs, rootstock a small corm; stem simple, leafy; l. few, scattered, linear, upper bracteiform; fl. small, erect, solitary, or corymbosely racemed, perianth 6-partite, rotate, segm. narrow, flat, clawed, caducous; stam. 6, hypogynous, erect, fil. very short, flattened, anth. oblong, versatile, dehiscing sub-introrsely; ov. sessile, 3-celled, cells many-ovuled, styles 3, short, linear, recurved, introrsely stigmatose; capsule loculicidal, 3-celled, many-seeded; seeds subglobose, testa thin, brown, appressed, embryo minute, in fleshy endosperm.—Sp. 5; 2 in *Fl. B. Ind.*

I. indica, *A. Gray in Kunth, Enum.* iv. 213 (1843).
Thw. Enum. 339. C. P. 3680.
Fl. B. Ind. vi. 357. Wall. Pl. As. Rar. t. 259 (*Anguillaria indica*).

Corm subglobose, $\frac{1}{3}$–$\frac{2}{3}$ in. diam., narrowed into a short neck, tunicate with pale brown sheaths; stem 3–6 in., rigid, strict, or flexuous; l. alt., 6–8 by $\frac{1}{6}$–$\frac{1}{2}$ in., narrowly linear or linear-lanceolate, acuminate, coriaceous, veins obscure, base sheathing; fl. solitary, or 2–6 in a short terminal raceme, erect; bracts linear or subulate, lower leafy, pedicel $\frac{1}{2}$–1 in.;

perianth-segm. $\frac{1}{8}$–$\frac{1}{4}$ in., very narrow, acuminate, spreading or recurved; stam. shorter than the oblong ov.; capsule erect, but variable in size, $\frac{1}{4}$–1 in. long, oblong or ovoid, obtuse at both ends, valves thin; seeds small.

Dry country in grassy, sandy places; rather common. Trincomalie (Glenie); Chilaw; Kirinde; Bintenne (Nevill); Nilgala; Anuradhapura. Fl. December; reddish-purple.

Also in India, Australia, and Philippine Is.

12. **GLORIOSA,** *Linn.*

An herbaceous, tall, glabrous, branching climber; rootstock of tuberous naked corms; stem terete, leafy; l. scattered, opp. or 3-nately whorled, ovate-lanceolate, cordate, nerves parallel, tip ending in a spiral tendril; fl. large, axillary, solitary, pedicels reflexed; perianth 6-partite, segm. subequal, narrow, spreading, or reflexed, persistent, waved, or crisped; stam. 6, hypogynous, fil. filiform, anth. linear, dorsifixed, versatile, slits extrorse; ov. 3-celled, cells many-ovuled, style filiform, deflexed, 3-fid, arms subulate, stigmatose introrsely; capsule large, coriaceous, septicidal; seeds subglobose, testa spongy, embryo cylindric in horny endosperm.—Sp. 3; 1 in *Fl. B. Ind.*

G. superba, *L. Sp. Pl.* 305 (1753). **Niyangala,** *S.* **Karttikaikilankụ, Ventonti,** *T.*

Herm. Hort. Lugd.-Bat. Cat. 688; Mus. 28 and 34. Burm. Thes. 158. Fl. Zeyl. n. 122. Moon, Cat. 25. Thw. Enum. 339. C. P. 2295.

Fl. B. Ind. vi. 358. Rheede, Hort. Mal. vii. t. 57. Wight, Ic. t. 2047. Bot. Reg. t. 77.

Rootstock of arched, solid, fleshy, white, cylindric corms, 6–12 in. long, and 1–1$\frac{1}{2}$ in. diam., pointed at each end, bifurcately branched (or V-shaped), producing a new joint at the end of each branch; roots fibrous; stems 10–20 ft., given off from the angle of the young corms (biennial, *Roxb.*), herbaceous; l. sessile, 6–8 in., variable in breadth, base rounded, cordate, or amplexicaul; pedicels 4–6 in., tip deflexed; fl. 3–4 in. across, segm. linear-lanceolate, crisply waved; fil. 2 in., spreading, connective of anth. $\frac{1}{4}$ in. long, green; style 2 in. long; capsule 2 in., linear-oblong.

Low country, in bushy places; common. Fl. Sept.–Jan.; at first greenish, passing through yellow, orange, and scarlet to crimson from base to apex.

Throughout India and in Burma, Malaya, Cochin-China, and Trop. Africa.

The character of the corms given above is from a note by Dr. Trimen, who further says that they are slightly acrid.

CXXXIV.—PONTEDERIACEÆ.

FRESH-WATER and marsh herbs; stem or rootstock short or long, creeping or floating, simple or branched; l. erect or floating, petioled, narrow or broad, veins slender, parallel, petiole often tumid and spongy with contained air-cells; base sheathing; infl. centrifugal; fl. bisexual, in peduncled spikes or racemes from the sheaths of the uppermost l., bracteate; perianth unequally 6-partite, segm. petaloid, marcescent; stam. 6, inserted on the base of the perianth-segm., one longest, with the fil. toothed on one side, anth. dorsifixed; ov. 3-celled, cells many-ovuled, style slender, stigma lobed, ovules anatropous; capsule membranous, loculicidally 3-valved; seeds small, embryo cylindric in floury endosperm.

MONOCHORIA, *Presl.*

For characters, see Order. Sp. about 4; 2 in *Fl. B. Ind.*

Fl. long-pedicelled . . . . 1. M. HASTÆFOLIA.
Fl. short-pedicelled . . . . 2. M. VAGINALIS.

1. **M. hastæfolia,** *Presl. Reliq. Haenk.* i. 128 (1830). **Duja-habarala,** *S.*

Herm. Mus. 71. Burm. Thes. 208. Fl. Zeyl. n. 129. *Pontederia hastata,* L. Sp. Pl. 288; Moon, Cat. 24. Thw. Enum. 321. C. P. 3213.
Fl. B. Ind. vi. 362. Roxb. Cor. Pl. t. 111. (*Pont. hastata*).

Rootstock very stout, creeping, spongy, clothed with brown or purple remains of old sheaths, emitting tufts of filiform roots clothed with root-hairs; flg. branches short; l. 6–7 by 5–6 in., cordate, hastate, or sagittate, obtuse or acute, many-veined, petiole of the floral l. 1–1½ in. long, tumid above, and embracing the short stout ped., petiole of the radical l. 18–24 in., base broad, sheathing; fl. crowded, racemed, or subumbelled; pedicels up to 1 in.; perianth ⅔–1 in. across, large segm. broadly obovate, smaller oblong; fil. of long stam. spurred; large anth. dark blue, the others yellow; capsule ¼ in. diam., oblong or subglobose.

Low country; common in ponds and streams. Fl. May, June; brilliant purplish-blue.
Also in India, Malaya, and China.

2. **M. vaginalis,** *Presl, Reliq. Haenk,* i. 128 (1830).

Moon, Cat. 24. Thw. Enum. 321. C. P. 2315.
Fl. B. Ind. vi. 363. Roxb. Cor. Pl. t. 110. Rheede, Hort. Mal. ii. t. 44.

Rootstock short, suberect or creeping, spongy; l. very variable, long-petioled, 2–4 in., from linear to ovate, or ovate-

cordate, acuminate, 7–9-veined, sometimes as broad as long; petioles of lower l. stout, terete; ped. emerging from the channelled sheath of the uppermost l.; raceme subsessile, spiciform, young globose, rhachis lengthening as the fl. expand, terminal fl. the first to open, pedicels $\frac{1}{8}$–$\frac{1}{4}$ in.; perianth $\frac{1}{2}$ in. across, segm. unequal, 3 larger obovate, 3 smaller oblong; fil. and anth. as in *M. hastæfolia;* capsule $\frac{2}{3}$ in. long, oblong.

Var. β, **plantaginea,** Solms. *M. plantaginea,* Kunth; Thw. Enum. 321. C. P. 3686.
Fl. B. Ind. l. c.

Whole plant smaller, l. narrow, raceme few-fld.

Low country, in ponds and wet places; common; var. β less frequent. Fl. March; blue.
Also in India, Malaya, China, Japan, Trop. Africa.

CXXXV.—XYRIDEÆ.

Erect, tufted, rush-like, scapigerous, glabrous herbs; stem short, simple; l. radical, elongate, narrowly linear, flat or terete, sheath short; scape stout or slender, stiff, as long or longer than the l., terete, angled, or compressed; fl. small, bisexual, solitary, sessile in the axils of the rigid imbricating bracts of a terminal globose or ovoid cone-like, naked spike, opening one at a time, 3-bracteolate; bracts orbicular, coriaceous, convex, persistent; bracteoles deciduous, lateral narrowly navicular, arched, scarious, keeled or winged, dorsal petaloid, broader, membranous, arching over the young fl.; pet. 3, usually long-clawed, obovate or spathulate, coloured; stam. 3, fil. short, inserted on the pet., anth. 2-celled, dorsifixed, dehiscence dorsal; ov. superior, 1-celled, style short, 3-fid, arms long, stigmas terminal, ovules many, on 3-parietal placentas, orthotropous; capsule obovoid, strongly laterally compressed, 1-celled, loculicidaly 3-valved, valves thin, with the placentas extending from the base to the apex; seeds very minute, oblong, strongly ribbed, embryo very minute in floury endosperm.

The bracteoles are regarded by some authors as sepals; by others the two lateral alone are regarded as bracteoles, the dorsal as a fourth petal.

XYRIS, *Linn.*

For characters, see Order.—Sp. 109; 7 in *Fl. B. Ind.*

L. flat, keel of lateral bracteoles serrulate.
 L. $\frac{1}{4}$–$\frac{1}{3}$ in. broad . . . . 1. X. INDICA.
 L. $\frac{1}{10}$–$\frac{1}{6}$ in. broad . . . . 2. X. ANCEPS.
L. hardly flattened, keel of lateral bracteoles quite entire.
 Scape compressed, bracts very dark . . . . 3. X. SCHŒNOIDES.
 Scape 2-edged, bracts pale . . . . . . 4. X. PAUCIFLORA.

1. **X. indica,** *L. Sp. Pl.* 42 (1753). *Raṅ-mota, S.*
Herm. Mus. 41. Burm. Thes. 109. Fl. Zeyl. n. 35. Moon, Cat. 6. Thw. Enum. 340. C. P. 3028.
Fl. B. Ind. vi. 364. Rheede, Hort. Mal. ix. t. 71.

Annual, 1–2 ft. high; l. as long as the scape, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, bifarious, narrowly loriform or ensiform, spongy, narrowed to an obtuse tip; scape robust, grooved, angles acute, spike $\frac{1}{2}$–1$\frac{1}{4}$ in., cylindric, ovoid or globose; bracts many, $\frac{1}{4}$ in. diam., broader than long, orbicular or cuneately obovoid, tumid, dark red-brown, shining, very coriaceous, margins scarious; fl. $\frac{1}{2}$ in. broad; lateral bracteoles dorsally winged, wing serrulate; claw of pet. as long as the sep., limb orbicular, erose; fil. short, broad, anth. oblong, cells obtuse above, acute at the base; staminodes 2–3 fid, arms penicillate; stigmas truncate.

Marshy ground in moist low country; common. Fl. Dec.; yellow.
Also in S. India, E. Bengal, and Malaya.

2. **X. anceps,** *Lam. Ill. Gen.* i. 132 (1791).
X. Walkeri, Arn. in Kunth, Enum. Pl. iv. 19; Thw. Enum. 340. C. P. 997.
Fl. B. Ind. vi. 364.

Annual (?), 1–2$\frac{1}{2}$ ft. high, base of stem surrounded with lanceolate, rigid, dark brown, shining scales; l. 6–12 by $\frac{1}{10}$–$\frac{1}{6}$ in., narrowly linear, rigid, pungent, twisted, strongly grooved on both surfaces, margins smooth or scaberulous; scape strongly compressed, rigid, grooved, twisted; spike $\frac{1}{3}$–$\frac{2}{3}$ in. long, globose or obovoid-oblong; bracts many, orbicular, or broadly oval, $\frac{1}{6}$–$\frac{1}{4}$ in. long, quite glabrous, margins narrowly scarious; keel of lateral bracteoles very narrowly winged, wing serrulate; anth.-cells narrow, each bifid at the top, acute at the base; staminodes thickly plumose from the base upward; stigmas obliquely truncate.

Marshy land in low country; rather common. Fl. Dec.–March; brilliant yellow.
Also in S. India, Burma, Malaya, China.

3. **X. schœnoides,** *Mart. in Wall. Pl. As. Rar.* iii. 30 (1832).
Thw. Enum. 340. C. P. 3380. *X. capensis* var. *schœnoides*, Nilsson, Xyris. 155.
Fl. B. Ind. vi. 365.

Annual (?), 1–2 ft. high; l. 2–8 by $\frac{1}{8}$–$\frac{1}{6}$ in., tapering from the base to the acuminate tip, soft, rather spongy; scape compressed, striate, rather stout; spike globose or ovoid, $\frac{1}{3}$–$\frac{1}{2}$ in. diam., dark brown or nearly black, few-fld.; bracts $\frac{1}{4}$ in. long, broadly oblong or orbicular, glabrous, membranous below the middle, margins not scarious, outer nearly as long as the spike; lateral bracteoles $\frac{1}{5}$ in. long, membranous, keeled, keel not winged, quite entire, dorsal with a keeled midrib; anth. and staminodes not seen.

Wet land, paddy-fields, &c., 2–6000 ft.; rather common. Fl. July, August; yellow.

Also in Himalaya and Nilgiri Mts., China.

4. **X. pauciflora,** *Willd. Phytograph.* i. 2 (1794).
Thw. Enum. 340. C. P. 999.
Fl. B. Ind. vi. 365. *Willd. Phytogr.* fasc. i. t. 1, f. 1.

Annual (?), 3–12 in. high; l. narrowly linear, 3–8 in., hardly $\frac{1}{6}$ in. broad, rigid, acute or acuminate, smooth; scape subterete or compressed and 2-edged, straight or slightly twisted, striate; spike globose, $\frac{1}{2}$–$\frac{1}{3}$ in. diam., pale brown; bracts few, $\frac{1}{7}$ in. diam., orbicular or obovate, rather thin, dorsally furfuraceous below the tip, margins broadly scarious; lateral bracteoles hyaline, keeled, keel quite entire, not winged; pet. broadly ovate; anth. subsessile, very small, didymous, cells obtuse at both ends; staminodes very slender, with a few terminal hairs.

Paddy-fields and other wet places in the low country; rather rare. Kurunegala; Matale; Ratnapura. Fl. Dec., Jan.; yellow.

Also in Bengal, Burma, Malaya, China, and Australia.

CXXXVI.—COMMELINACEÆ.

HERBS, rarely climbers, or undershrubs; l. alt., bases sheathing, obliquely penniveined or veins parallel; infl. cymose or panicled; fl. bisexual, often more or less irregular; perianth inferior, 6-partite in 2 series, 3 outer (sep.) herbaceous or membranous, usually marcescent and persistent; 3 inner (pet.) petaloid, free or with claws connate in a tube below, often very unequal, marcescent, two much larger than the others, limb spreading; stam. 6, inserted on the bases of the segms., all perfect, or 2–4 with imperfect anth. (staminodes), fil. naked or bearded with jointed hairs, anth. oblong or globose, often

dissimilar; ov. 3-celled, cells 1- few-ovuled, style terminal, often bearded, stigma small, or style enlarged at or below the summit, ovules orthotropous; capsule loculicidal (indehiscent in *Pollia*); seeds various, testa smooth or rugose, embryo minute, immersed in floury endosperm.

The specific characters of this Order here given have been for the most part collated with Mr. Clarke's excellent monograph of Commelinaceæ in Alph. Dc. Monog. Phanerog. vol. iii.). These having been very carefully drawn up from specimens collected over the greater part of India, afford some characters which may not be present in the hitherto collected Ceylon forms, but which may be found to occur when the latter are better known.

Fr. indehiscent, crustaceous . . . . 1. POLLIA.
Capsule loculicidal.
  Stamens, 3 perfect, with 2–3 imperfect (staminodes).
    Cymes enclosed in a spathe, fil. glabrous . . 2. COMMELINA.
    Cymes panicled, fil. bearded . . . . . . 3. ANEILEMA.
  Stamens, 6 perfect.
    Cymes scorpioid, of imbricating bracteoles (except *C. axillaris*) . . . . 4. CYANOTIS.
    Fl. in a terminal panicle . . . . . . 5. FLOSCOPA.

1. **POLLIA,** *Thunb.*

Tall, erect, sparingly branched, leafy herbs; l. lanceolate, base narrowed, sheathing; fl. in terminal, pubescent panicles, bracts at the axils of the branches deciduous, bracteoles persistent; sep. 3, subpetaloid, concave, accrescent, persistent; pet. 3, free, deciduous; stam. 3, with 3 staminodes, fil. naked, anth.-cells parallel, staminodes as long as the stam; ov. ovoid, 3-celled, cells many-ovuled, style slender, curved, stigma 3-lobed; fr. globose, indehiscent, many-seeded; seeds trapeziform, closely packed, and immersed in a central receptacle.—Sp. 14; 5 in *Fl. B. Ind.*

1. **P. sorzogonensis,*** *Endl. ex Miq. Fl. Ind. Bat.* iii. 541 (1855).
P. indica, Thw. Enum. 323. C. P. 2327.
Fl. B. Ind. vi. 367. Wight, Ic. t. 2068 (*Aclinia indica*).

Stem 2–3 ft., stout, terete, glabrous or puberulous, viscid; l. sessile or petioled, 4–12 by 2–3 in., oblong-lanceolate, finely acuminate, glabrous on both surfaces, base acute, petiole 0–1 in., sheath smooth, mouth truncate; ped. short or long, pubescent with spreading and deflexed hairs, carrying one or two small amplexicaul l.; panicle erect, 1–5 in. long, viscidly pubescent, branches alternate, decurved, spiciform, bracts oblong, bracteoles minute, ochreate; fl. ½ in. broad; sep.

* Sorzogon is on the coast of Luzon.

orbicular-ovate, glabrous or pubescent; pet. orbicular; fil. slender, anth. minute; fr. ⅓ in. diam., blue, shining.

Shady places in low country; rather rare. Fl. August, Sept.; white or pale pink.

Also in India, Burma, Malaya, China, New Caledonia.

2. **COMMELINA,** *Linn.*

Annual, branching herbs, usually diffuse, often creeping below; l. various, veins subparallel; infl. of simple or bifid scorpioid cymes enclosed in a complicate spathe, from which the fl. emerge singly; sep. 3, small, free or two connate; pet. 3, two large, clawed, third smaller, subsessile; stam. 3, hypogynous, fil. slender, naked, anth. oblong, one larger than the others; staminodes 2 or 3, like the stam., but with deformed cruciform anths.; ov. 3-celled, or 2-celled from the suppression of the dorsal cell, cells 1–2-ovuled, style slender, glabrous, stigma punctiform; capsule hidden in the spathe by the decurving of the pedicel of the cyme after flg., 2–3-celled, loculicidally 3-valved, or with the dorsal cell indehiscent, cells 1–2-seeded, valves membranous or coriaceous; seeds small, testa various, smooth, tubercled, or pitted, embryo at the ventral side of the seed.—Sp. about 90; 20 in *Fl. B. Ind.*

The species of *Commelina* are very variable in size, habit, and indumentum, and the Herbarium material from Ceylon of several is quite insufficient for good descriptions.

Ov. 3-celled, two cells 2-ovuled, one 1-ovuled or obsolete.
  Capsule 3-celled.
    Spathe ovate or ovate-lanceolate . . 1. C. NUDIFLORA.
    Spathe funnel-shaped or turbinate . . 2. C. BENGHALENSIS.
  Capsule 2-celled.
    L.-sheaths long.
      L. ovate or lanceolate.
        L. ½–3 in., sessile . . . . 3. C. CLAVATA.
        L. 3–5 in., petioled . . . . 4. C. PERSICARIÆFOLIA.
      L. narrowly linear . . . . . 5. C. THWAITESII.
    L.-sheaths very short . . . . 6. C. ATTENUATA.
Ov. 2–3-celled, cells 1-ovuled.
  Spathe subsessile, short, broad.
    Capsule 3-celled.
      L. 4–7 in., membranous . . . 7. C. OBLIQUA.
      L. 2–6 in., subcoriaceous . . . 8. C. KURZII.
    Capsule 2-celled . . . . . . 9. C. ENSIFOLIA.
  Spathe long-peduncled, narrow . . . 10. C. APPENDICULATA.

1. **C. nudiflora,** *L. Sp. Pl.* 41 (1753). **Girapala,** *S.*

Herm. Mus. 16. Fl. Zeyl. n. 31. Moon, Cat. 5 (also *C. diffusa*, Burm.). *C. salicifolia*, Thw. Enum. 321 (part), non Roxb. Clarke, Mon. Comm. 144. C. P. 3358.

Fl. B. Ind. vi. 369. Clarke, Comm. Beng. t. 1 (*C. communis*).

Stem 2–3 ft. and upwards, as thick as a crow-quill, branching from the base, branches prostrate or subscandent, rooting at the rather distant nodes, tips ascending; l. $1\frac{1}{2}$–3 by $\frac{1}{2}$–$\frac{2}{3}$ in., sessile, lanceolate or ovate-lanceolate, acute or acuminate, glabrous or puberulous, ciliate, sheath $\frac{1}{2}$–1 in. long, loose, glabrous; ped. $\frac{1}{2}$–$\frac{3}{4}$ in., spreading or erect; spathes $\frac{2}{3}$–1 in., ovate or ovate-lanceolate, acute, glabrous or pubescent, base cordate, lobes rounded; cymes 1- few-fld., shortly pedicelled; fl. $\frac{1}{2}$–$\frac{2}{3}$ in. broad; large pets. orbicular or cordate; ov. 3-celled, 2 cells 2-ovuled, 1 1-ovuled; capsule $\frac{1}{5}$ in., broadly oblong, acuminate, coriaceous, 5-seeded; seeds oblong, cylindric, tubercled and reticulate, brown.

In shady places amongst grass in the low country; very common. Fl. Jan.; brilliant cobalt-blue.

Also in E. Bengal, Burma, Malaya, China, New Caledonia.

Burman's figure (Thes. t. 20, f. 2, and p. 69), *C. paludosa*, Moon, is probably this (but is not quoted by Linn. in Fl. Zeyl.) or *C. clavata*. The Fl. B. Ind. refers it to *C. persicariæfolia*. I entirely omitted this species in my Syst. Cat. Ceyl. Pl.; and in Journ. Linn. Soc. xxiv. 134, have inadvertently referred Hermann's specimen and Linnæus's species to *Aneilema nudiflora*, R. Br. Hermann's name is 'Diameneriya,' which is usually given to the following.—*Trimen.*

2. **C. benghalensis,** *L. Sp. Pl.* 41 (1753). **Diya-menériya,** *S.*
C. cucullata, Moon, Cat. 5. Thw. Enum. 321. Clarke, Mon. 159. C. P. 2314.
Fl. B. Ind. vi. 370. Wight, Ic. t. 2065. Clarke, Comm. Beng. t. 4.

Stem 2–3 ft., slender, dichotomously branched from the base upwards, branches hirsute or pubescent, creeping and rooting below; l. shortly petioled, 1–3 by $\frac{1}{2}$–$1\frac{1}{2}$ in., ovate or oblong, obtuse, pubescent or villous on both surfaces, base unequal-sided, rounded, cuneate or cordate, veins 7–11 pairs, sheath short or long, pubescent, villous or ciliate; spathes 1–3 together; shortly peduncled, funnel-shaped or turbinate, auricled on one side, pubescent or hirsute; upper cyme-branch 2–3-fld., lower 1–2-fld. or 0; sep. small, oblong, pubescent; larger pets. orbicular or transversely oblong; anth. oblong; ov. 3-celled, two cells 2-ovuled, one 1-ovuled; capsule $\frac{1}{4}$ in. long, pyriform, membranous, 5-seeded; seeds oblong, closely pitted.

Low country, a common weed in grass; common. Fl. Nov.–Feb.; bright blue.

Throughout Tropical Asia and Africa.

Sometimes produces leafless shoots from base of stem which bear cleistogamous flowers, followed by depauperate, pisiform, subterranean capsules.

3. **C. clavata,** *Clarke, Comm. and Cyrt. Beng.* t. 5 (1874). **Giri-pala,** *S.*

C. salicifolia, Thw. Enum. 321 (in part), non Roxb. Clarke, Mon. 171. C. P. 2979.
Fl. B. Ind. vi. 371. Clarke, Comm. Beng. t. 5.

Stem 1–3 ft., sparingly branched; branches diffuse, as thick as a crow-quill; l. sessile, ½–3 by ½–⅔ in., oval, narrowly lanceolate or ovate, acuminate, glabrous, puberulous, or pubescent on one or both surfaces, sheath ½–1 in., narrowed into the blade, glabrous, pubescent, or hirsute at the mouth; spathes long-peduncled, orbicular-ovate or ovate-lanceolate, acuminate, glabrous, or pubescent, base rounded or cordate; ov. 2-celled, cells 2-ovuled; capsule ¼ in. long, compressed, oblong, constricted in the middle, tip bicuspidate, 4-seeded, or obovate and 2-seeded, the lower ovules being arrested; seeds reticulate, black or nearly so.

Low country; a common weed. Fl. Oct.–Dec.; blue.
Also in India and Java.
Very near *C. nudiflora*, L., differing in the absence or emptiness of the dorsal cell of the capsule.

4. **C. persicariæfolia,** *Wight in Wall. Cat.* n. 8984 (1828).
Clarke, Mon. 171. (?) *C. paludosa*, Moon, Cat. 5.
Fl. B. Ind. vi. 372. (?) Burm. Thes. 69. t. 20, f. 2.

Stem diffusely branched, 2–3 ft., as thick as a goose-quill, pubescent; l. 3–5 by 1–2 in., long-petioled, ovate, ovate-lanceolate or -cordate, acuminate, glabrous or puberulous, many-veined, base rounded or narrowed into a petiole ¼–½ in. long, sheath 1–1½ in., pubescent with spreading hairs; spathes 1–1½ by 1 in., very shortly peduncled, broadly ovate, acuminate, base subtruncate, or cordate with rounded lobes; fl. nearly an inch across, 2 larger pets. almost reniform, third one-half the size of the other two; ov. 2-celled, cells 2-ovuled; capsule oblong, obtuse, 2-celled, cells 2-seeded; seeds oblong, terete, smooth or obscurely rugose.

Ceylon (Regnaud), ex Clarke, l. c.
Also in Southern India and Burma.
There is no specimen from Ceylon of this species in Herb. Peraden. or Kew. The description of the leaves and fl. is taken from an excellent drawing supposed to be of this species in Herb. Peraden.; those of the ov., capsule, and seeds, from Indian specimens described by Clarke.—J. D. H.

5. **C. Thwaitesii,** *Hook. f.*
C. salicifolia, var. *angustata;* Thw. Enum. 321. C. P. 3215.

Stem stout or slender, sparingly branched, glabrous; l. sessile, 4–6 by ⅙–⅓ in., narrowly linear, acute or acuminate, quite glabrous, 5-veined, sheath ⅓–1⅓ in., mouth ciliate; spathe long-peduncled, 1–2½ in. long, ovate or ovate-lanceolate, caudate-acuminate, base cordate, lobes rounded, quite gla-

brous; ov. 2-celled, cells 2-ovuled; capsule $\frac{1}{4}$ in. long, quadrately oblong, compressed, constricted in the middle, shortly beaked, valves coriaceous, cells 2-seeded; seeds $\frac{1}{7}$ in. long, oblong, deeply pitted, pale brown.

Low country; apparently rare. Maturata, Sept. 1853 (Thwaites). Fl. Sept.

Endemic.

Referred by Trimen in Herb. Peraden. to *C. attenuata*, Vahl. The pitted seeds of this species are distinctive. The fl. are too imperfect for description.

6. **C. attenuata,** *Vahl, Enum.* ii. 168 (1806).
Clarke, Monogr. 172.
Fl. B. Ind. vi. 372. Clarke, Comm. Beng. t. 7 (*C. rajmahalensis*).

Stem 1–2 ft., very slender, much branched, glabrous or sparsely hairy; l. sessile, 2–4 by $\frac{1}{6}$–$\frac{1}{4}$ in., erect, striate, linear, acute, costate, veins few, glabrous, or with a few long white hairs on the upper surface, sheath very short, hardly distinct from the base of the l., margin ciliate; spathes long-peduncled, 1–1$\frac{1}{2}$ in. long, narrowly ovate-lanceolate, caudate-acuminate, glabrous, base sagittately cordate, lobes obtuse, ped. $\frac{1}{2}$–1 in., very slender, pubescent along the upper surface; ov. 2-celled, cells 2-ovuled; capsule $\frac{1}{10}$ in. long, obovoid or oblong, compressed, membranous, 2-celled, cells 1–2-seeded; seeds large when solitary, $\frac{1}{6}$ in. long, oblong, smooth, compressed, testa pale yellow-brown, thickened and white at either end, when 2 in a cell the lower seed is much smaller.

Uva (Trimen). Fl. Jan. (1888).

Central and Southern India.

The very short l.-sheaths, and sagittately cordate base of the spathe are characteristic of this amongst the Ceylon species. Indian specimens vary greatly in size, habit, and foliage.

7. **C. obliqua,** *Ham. in Don, Prodr.* 45 (1825).
Thw. Enum. 322. Clarke, Mon. 178. C. P. 2326.
Fl. B. Ind. vi. 372. Wight, Ic. t. 2066 (*C. polyspatha*).

Stem 2–3 ft., stout, branched, glabrous, branches widely creeping below; l. 4–7 by 1–2 in., sessile or petioled, lanceolate or ovate-lanceolate, finely acuminate or caudate, membranous, glabrous, scabrous or villous, sheath $\frac{3}{4}$–1 in., mouth ciliate with long hairs; spathes sessile or very shortly peduncled, $\frac{3}{4}$–1 in. broad and long, solitary or crowded, turbinately funnel-shaped, cuspidate, glabrous; fl. $\frac{2}{3}$ in. across, clawed pets. orbicular; ov. 3-celled, cells 1-ovuled; capsule $\frac{1}{3}$ in. long, obovoid or oblong, trigonous, 3-celled, 3-valved, 3-seeded; seeds $\frac{1}{4}$ in. long, oblong or ellipsoid, smooth, puberulous, lead-col'd.

Moist low country, above 1000 ft.; rare. Matale and Maturata (Thwaites). Fl. Jan., Feb.; bright blue.

India and the Malay Is.

Clarke (l. c.) does not give this as for Ceylon, and quotes C. P. 2326 under the very different *Aneilema montanum.* There is no Ceylon specimen in Herb. Kew.

8. **C. Kurzii,** *Clarke in Journ. Linn. Soc.* xi. 444 (1871).
C. longifolia, Thw. Enum. 322 (part) (non Lam.). Clarke, Mon. 185. C. P. 3224 (part).
Fl. B. Ind. vi. 373.

Stem robust, hairy or glabrate; l. 2–6 by $\frac{1}{4}$–$\frac{3}{4}$ in., subsessile, narrowly lanceolate, caudate-acuminate, rather coriaceous, scaberulous or puberulous, base unequal-sided, sheath $\frac{1}{2}$–1 in., ciliate; spathes $\frac{3}{4}$–1 in. long and broad, sessile in subterminal capitate clusters, rarely solitary, broadly turbinate, acute, cucullate, pubescent or puberulous; larger pets. $\frac{1}{2}$–$\frac{2}{3}$ in. diam., orbicular; ov. 3-celled, cells 1-ovuled; capsule $\frac{1}{4}$ in. diam., obovoid, pyriform or subglobose, trigonous, brown, dorsal cell small, indehiscent; seeds $\frac{1}{6}$ in. long, ellipsoid, smooth, ashy grey, of the dorsal cell hemispheric.

Low country; rather rare. Between Haragama and Maturata (Thwaites). Fl. Dec.–Feb.; pale violet-blue.
Also in S. India.

9. **C. ensifolia,** *Br. Prod. Fl. Nov. Holl.* 269 (1810).
C. longifolia, Thw. Enum. 322 (part), non Lam. Clarke, Mon. 188. C. P. 3224 (part).
Fl. B. Ind. vi. 374.

Stem diffusely branched, branches 12–18 in., slender, creeping below, glabrous or pubescent; l. 2–4 by $\frac{1}{6}$–$\frac{1}{2}$ in., sessile, narrowly linear-lanceolate, acuminate, glabrous or pubescent on both surfaces, coriaceous, veins few, base narrowed, sheath lax, $\frac{1}{2}$–$\frac{2}{3}$ in., mouth ciliate with long hairs; spathes 1–3, contiguous, $\frac{1}{3}$–$\frac{2}{3}$ in. long, very shortly peduncled, broadly triangular-ovate, acute, cucullate, straight, or recurved, membranous, glabrous or hairy, base truncate or rounded; ov. 2-celled, cells 1-ovuled; capsule transversely oblong, about $\frac{1}{6}$ in. broad, 2-celled, 2-seeded, valves coriaceous; seeds ellipsoid or cymbiform, smooth, dorsally convex, ventrally concave, puberulous.

Dry region; rare. Ella Pass, Uva. (The C. P. specimens are without locality.) Fl. Sept.
Also in India and Australia.

10. **C. appendiculata,** *Clarke, Comm. and Cyrt. Beng.* t. 13 (1874).
Clarke, Mon. 186.
Fl. B. Ind. vi. 374. Clarke, Comm. Beng. t. 13.

Stem rather stout, diffusely branched from the base, branches 2–3 ft., ascending, glabrous; l. sessile, 4–6 by $\frac{1}{6}$–$\frac{2}{3}$ in., narrowly linear or linear-lanceolate, narrowed at both ends

nearly glabrous, coriaceous, few-veined, sheath 1–2 in., strongly veined, mouth glabrous; spathes 2–3 in. long, very long-peduncled, narrowly ovate-lanceolate, caudate-acuminate, glabrous without, hairy within, striate, base deeply cordate, lobes rounded, ped. 1–1½ in.; larger pets. ½ in. diam., orbicular, claw rather short; ov. 3-celled, cells 1-ovuled; capsule ⅓ in. long, 3-celled, 3-seeded, or with the dorsal cell empty; seeds ⅕ in. long, oblong, sub-plano-convex, pale brown, smooth, testa thickened and white at one or at both ends.

Dry region; rather rare. Uva Prov. Fl. December; bright blue. Also in N. Bengal, Sikkim, and Sylhet.

3. **ANEILEMA,** *Br.*

Simple or branched, erect or decumbent herbs, with fibrous or rarely tuberous roots; l. usually narrow and sessile, rarely broader and petioled; fl. cymose, in open axillary and terminal panicles, bracteate and bracteolate, bracts not complicate or cucullate; sep. 3, free, membranous, persistent, outer, or all concave, 2 inner unilateral; pet. 3, free, subequal, sessile, or shortly clawed, deciduous or marcescent; stam. 2 or 3 with perfect anth., and 2–4 (rarely 0) reduced to staminodes with imperfect anth., fil. of all slender, bearded or not; ov. sessile, 2–3-celled, cells 1–many-ovuled, style slender, naked or bearded, stigma minute; capsule 2–3-celled, loculicidally 2–3-valved, cells 1–many-seeded; seeds various, testa thick, smooth, rugose, or foveolate, embryo at one end of the seed.—Sp. about 60; 28 in *Fl. B. Ind.*

Cells of ov. 3- many-ovuled.
  Scapigerous, l. all radical . . . . . . 1. A. GLAUCUM.
  Stem leafy.
    Root of clavate fleshy fibres . . . . . 2. A. ESCULENTUM.
    Root of slender fibres.
      Panicle with long spreading branches . . 3. A. ZEYLANICUM.
      Panicle small, branches short.
        Seeds black . . . . 4. A. DIMORPHUM.
        Seeds pale . . . . 5. A. SPIRATUM.
Cells of ov. 2-ovuled.
  Stem decumbent, l. 2–5 in. . . . . . . 6. A. NUDIFLORUM.
  Stem tall, erect, l. 6–18 in. . . . . . 7. A. GIGANTEUM.
Cells of ov. 1-ovuled.
  L.-sheath very short or 0 . . . . . . 8. A. VAGINATUM.
  L.-sheath long.
    Capsule glabrous . . . . 9. A. MONTANUM.
    Capsule pubescent . . . . 10. A. PROTENSUM

1. **A. glaucum,** *Thw. ex Clarke, Monogr.* 200 (1881).
Trim. Syst. Cat. Ceyl. 95. C. P. 3977.
Fl. B. Ind. vi. 375.

Rootstock very short, with tufted fibrous roots; stem 0; l. 4–9 by 1–1½ in., sessile, broadly ensiform or oblanceolate, acuminate, thin, margins undulate, glabrous, veins many, parallel, base ½–⅔ in. broad, sheath 0; scapes many, shorter than the l., slender, erect; fl. in a widely spreading terminal panicle 8–12 in. long, with very slender branches often from the base upwards, lax-fld.; bracts at the axils of the branches small, not sheathing; bracteoles minute, ovate, persistent; pedicels about ½ in.; fl. ½ in. broad, sep. ovate, acute; pet. subequal; fertile stam. 3, anth. subsimilar, fil. bearded below the middle; staminodes 2; ov. subequally 3-celled, cells 5- or more-ovuled; capsule ¼ in. long, subclavate, trigonous, acute, subequally 3-celled, seeds 5–8 in each cell, superposed in one series, angular, smooth, white, with a minutely reticulate epidermis, the central ones in each row depressed.

Moist low country; very rare. Potupitiya, Kukul Korale (Thwaites). Fl. July; pale-pinkish-violet.

Also in Travancore.

2. **A. esculentum,** *Wall. Cat.* n. 5208 (1828).
Clarke, Mon. 206.
Fl. B. Ind. vi. 377.

Stem 6–18 in., subsimple, erect, glabrous, leafy, with a thickened stoloniferous rootstock giving off clusters of fleshy, stout root-fibres, with thickened extremities; l. 3–4 by ¼–½ in., chiefly radical, linear, obtuse or acute, recurved, nearly glabrous, coriaceous, many-veined, base narrowed into a short sheath; panicle 1–3 in. long and broad, glabrous, branches alt., spreading, lower bracts 1 in., ovate, and small obtuse bracteoles persistent; pedicels $\frac{1}{10}$–$\frac{1}{6}$ in., fl. about $\frac{1}{6}$ in. broad; stam. 3, fil. bearded; ov. 3-celled, cells several-ovuled; capsule ellipsoid-oblong, ⅕–¼ in. long, acute, cells 3–5-seeded, valves thin; seeds $\frac{1}{20}$ in. diam., superposed in one series, cubical, dark brown, obscurely scabrid or pitted.

Ceylon (Walker in Herb. Kew).

Also in S. India, China, and Australia.

3. **A. zeylanicum,** *Clarke, Monogr.* 204 (1881).
A. dimorphum, Thw. Enum. 322 (? Dalz.). C. P. 2035.
Fl. B. Ind. vi. 376.

Stem 6–12 in., erect, stout or slender, simple or branched from the base, leafy, glabrous or puberulous; root-fibres capillary; l. 1–6 by 1–1½ in., narrowly oblong, narrowed at both ends, acute or acuminate, glabrous or pubescent on both surfaces, uppermost rounded at the base, veins parallel, margins sometimes crisped, base narrowed into the short pubescent sheath; panicle glabrous, 2–4 in. long and broad,

branches alternate, spreading, slender, bracts hardly sheathing, glabrous, persistent, bracteoles minute, pedicels $\frac{1}{6}$–$\frac{1}{4}$ in., fl. about $\frac{1}{4}$ in. diam.; pet. broadly ovate; stam. 3, fertile, anth. large, oblong; ov. 3-celled, cells 3–5-ovuled; capsule $\frac{1}{8}$–$\frac{1}{6}$ in. long, oblong or clavate, mucronate, cells 3–5-seeded; seeds $\frac{1}{40}$ in. diam., uniseriate in the cells, subcubical, or shortly oblong, angled, slightly pitted, brown, dusted with white.

Low country to 3000 ft.; rather rare. Lunugala, Uva; Ella; Haragama. Fl. Sept., Jan.; white.

Also (var. *longiscapum*) in S. India.

Clarke, l. c., quotes Thwaites's *A. protensum* for this, but C. P. 3026 (its number) is given under that separate species of Wallich's at p. 219. He also gives *A. montanum* of Thwaites here, and, though he quotes C. P. 2325, this number is also again given at p. 218 for true *A. montanum*, Wight.

4. **A. dimorphum,** *Dalz. in Hook. Journ. Bot.* iii. 138 (1851).

A. scapiflorum, var. *minus*, Thw. Enum. 322. Clarke, Mon. 206. C. P. 3314.

Fl. B. Ind. vi. 377. Wight, Ic. t. 2075 (*A. paniculatum*).

Stems many, branching from the fibrous roots, branches erect or ascending, stout or slender, 6–12 in. long, leafy, glabrous; l. 1–2$\frac{1}{2}$ by $\frac{1}{3}$–$\frac{1}{2}$ in., linear or linear-oblong, obtuse or acute, coriaceous, glabrous or minutely puberulous, margins thickened, base cordate, rounded or narrowed, often vinous-red beneath, mouth of short sheath ciliate; panicle small, 1–1$\frac{1}{2}$ in. long and broad, branches slender, flexuous, lower bracts 0 or small, bracteoles minute, ovate, persistent; fl. $\frac{1}{2}$ in. diam., pet. obovate, subacute; stam. 3 fertile, fil. long, bearded, fil. of staminodes naked; ov. 3-celled, cells 3–5-ovuled; capsule $\frac{1}{6}$–$\frac{1}{4}$ in. long, oblong, trigonous, shining; seeds 3–5, uniseriate in each cell, $\frac{1}{15}$ in. diam., subcubical, cupped at one end, brown-black, minutely striate.

Moist region 2–6000 ft.; rather common. Badulla; Nuwara Eliya; Hakgala. Fl. April, June; blue.

Also in S. India.

5. **A. spiratum,** *Br. Prod. Fl. Nov. Holl.* 271 (1810).

A. nanum, Kunth, Thw. Enum. 322. Clarke, Mon. 207. C. P. 2329.

Fl. B. Ind. vi. 377. Wight, Ic. t. 2077 (*A. nanum*).

A dwarf annual, branched from the base, branches 6–10 in., decumbent and rooting below, leafy; l. small, $\frac{1}{4}$–2 in., sessile, from oblong to lanceolate, flat, subacute or acuminate, glabrous, puberulous or ciliate, veins slender, base obtuse, cordate or amplexicaul, sheath very short; panicle small, branches short, spreading, few-fld., bracts small, ovate, persistent, bracteoles minute, fl. about $\frac{1}{3}$ in. diam.; pet. broadly oblong, obtuse; stam. 3 fertile, fil. of staminodes

naked or bearded; ov. 3-celled, cells 3-many-ovuled; capsule $\frac{1}{10}$–$\frac{1}{6}$ in. long, oblong, subtrigonous, cells 3–7-seeded; seeds uniseriate, minute, angular or cubical, white or straw-col'd.

Low country in damp sandy pastures; very common. Fl. all the year; pale pinkish-violet.

Throughout India, Malaya, China.

6. **A. nudiflorum,** *Br. Prod. Fl. Nov. Holl.* 271 (1810).

Thw. Enum. 322. Clarke, Mon. 210. C. P. 3313.

Fl. B. Ind. vi. 378. Clarke, Comm. Beng. t. 21. (?) Burm. Fl. Ind. t. 8, f. 1.

Stem subsimple or branched from the base, branches 6–12 in., decumbent below and rooting at the nodes, leafy, root fibrous; l. 2–6 by $\frac{1}{4}$–$\frac{3}{4}$ in., linear-oblong or lanceolate, acute or acuminate, flat, glabrous, hairy or subvillous, rather thin, veins slender, base rounded, cordate or narrowed into the hairy sheath, margins and mouth of sheath stoutly ciliate; panicles axillary and terminal, very small, few-fld.; fl. small, secund, shortly pedicelled, bracteoles $\frac{1}{6}$ in., cymbiform, caducous; pet. suborbicular; stam. 2 perfect, fil. bearded; ov. 3-celled, cells 2-ovuled, style naked; capsule $\frac{1}{8}$ in. long, trigonously subglobose, mucronate, membranous, cells 2-seeded; seeds $\frac{1}{20}$ in. diam., subcubical, brown, tuberculate or rugose.

Var. β, **terminale,** *Clarke, l. c.* Wight, Ic. t. 2076 (*A. terminale*). C. P. 3027.

Stem stouter, l. broader, branches of panicle long, cymes 1–2 in. long, closely scarred after flg., fl. secund, capsules larger, seeds less rugose.

Damp sandy ground in moist region to 3000 ft.; common. Var. β, Kukul Korale. Fl. all the year.

Also in India, China, Malaya.

This is *Commelina nudiflora*, L. Mant., but not of his Sp. Pl. Var. β, *terminale*, has a very different infl. from the type.

7. **A. giganteum,** *Br. Prod. Fl. Nov. Holl.* 271 (1810).

A. ensifolium, Wight, Thw. Enum. 322. Clarke, Mon. 212. C. P. 2324.

Fl. B. Ind. vi. 379. Wight, Ic. t. 2074 (*A. ensifolium*).

Stem 1–3 ft., erect, leafy, internodes long; roots of stout cylindric fleshy fibres, 4–6 in. long; l. 6–18 by $\frac{1}{3}$–$\frac{1}{4}$ in., elongate-linear, finely acuminate, flat, coriaceous, striate, narrowed into the long or short coriaceous sheath, glabrous, or nearly so; ped. elongate, naked, or with tubular acuminate sheaths; panicle short, sparingly branched, with ovate-cordate bracts at the axils of the branches; branches 1–2 in., almost pectinately scarred, many-fld., bracts ovate, acuminate, bracteoles $\frac{1}{4}$ in., orbicular, concave, caducous; fl. $\frac{1}{2}$ in. diam., pedicels very

short; sep. oblong, acute; pet. suborbicular; stam. 3 perfect, fil. all of equal length, and bearded; ov. 3-celled, cells 2-ovuled, style naked; capsule $\frac{1}{3}$ in. long, ellipsoid or oblong, mucronate, cells 2-seeded, valves hard, polished; seeds irregularly shaped, compressed, brown, echinulate or rough.

Moist low country below 1000 ft.; rather rare. Pasdun Korale; Kalawane, S. Prov. Fl. Sept., Dec., March; pale purplish-blue.

Also in India, Malaya, China, Africa, Australia.

8. **A. vaginatum,** *Br. Prod. Fl. Nov. Holl.* 271 (1810).
Thw. Enum. 322. Clarke, Mon. 216. C. P. 2328.
Fl. B. Ind. vi. 381. Wight, Ic. t. 2076.

Stem 6–18 in., very slender, flaccid, rooting at the lower nodes, flg. branches ending in filiform peduncles, with distant flg. bracts; root-fibres stout, almost fleshy; l. 3–6 by $\frac{1}{6}$–$\frac{1}{4}$ in., elongate-linear, acuminate, flat, glabrous or sparsely hairy, veins faint, base forming a short open ciliate sheath; fl. small, fascicled in distant bracts along the filiform, very slender terminations of the branches, long-pedicelled; bracts $\frac{1}{3}$–$\frac{1}{2}$ in., erect, narrowly oblong, obtuse, sheathing, strongly ribbed; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in., very slender, puberulous, 1–2-jointed; bracteoles at the bases of the pedicels, linear, hyaline; sep. $\frac{1}{6}$ in., ovate-oblong, obtuse, glabrous or pubescent; pet. orbicular; stam. 2 perfect, fil. bearded, staminodes 3, ov. 2-celled, cells 1-ovuled; capsule $\frac{1}{10}$–$\frac{1}{8}$ in. diam., globose, cuspidate, shining, 3-celled, 1–3-seeded; seeds trigonously conic, nearly black, one end abruptly truncate, flat, the other narrowed, obtuse, containing the embryo, two of the sides each with two large superposed pits.

Low country in both regions; common. Fl. Feb., May, July; blue.

Also throughout India, China.

Habit and infl. very different from the other Ceylon species. The panicle is reduced to a long filiform rhachis with very distant bracteate clusters of fl.

9. **A. montanum,** *Wight, in Wall. Cat.* n. 5203 (1828).
Thw. Enum. 322. Clarke, Mon. 217. C. P. 2325.
Fl. B. Ind. vi. 381. Wight, Ic. t. 2069 (*Dictyospermum montanum*).

Stem 12–18 in., erect or suberect, creeping and rooting below, simple or sparingly branched, glabrous or puberulous above, roots of tortuous fibres; l. petioled, 3–6 by 1$\frac{1}{2}$–2 in., ovate-lanceolate, acuminate or caudate, thin, glabrous or puberulous, costate, veins slender, base narrowed into a broad cuneiform petiole, $\frac{1}{4}$–$\frac{1}{3}$ in. long, sheath $\frac{1}{2}$–1$\frac{1}{4}$ in.; panicle terminal, erect, branches few, long, very slender, spreading, distantly scarred, glandular, flg. at the tips; fl. few, about $\frac{1}{6}$ in. broad, pedicels $\frac{1}{12}$–$\frac{1}{10}$ in., bracteoles hemispheric, caducous; sep. ovate, subacute; pet. broadly oval; stam. 3, fil.

glabrous, staminodes 0; ov. 3-celled, cells 1-ovuled; capsule subglobose, $\frac{1}{6}$ in. diam., glabrous, shining, 1–3-seeded; seeds compressed or hemispheric, coarsely pitted, white.

Shady places in moist region to 3000 ft. or more; rather common. Fl. Sept.

Also in S. India and Assam.

Clarke (l. c.) quotes also for this C. P. 2326, which is *Commelina obliqua*.

10. **A. protensum,** *Wall. Cat.* n. 5218 (1828).

Thw. Enum. 322. Clarke, Mon. 219. C. P. 3026.

Fl. B. Ind. vi. 382 (*A. scaberrimum*). Wight, Ic. t. 2071 (*Dictyospermum protensum*).

Stem 2–3 ft., stout or slender, erect, branched, leafy, glabrous or pubescent, lower nodes geniculate, with stout tortuous root-fibres; l. 3–6 by $\frac{2}{3}$–$1\frac{1}{4}$ in., lanceolate or oblong-lanceolate, finely acuminate, scaberulous on both surfaces, costate, veins slender, base rounded or narrowed into a short broad petiole, sheath $\frac{3}{4}$–1 in., loose, hispidulous, mouth ciliate; panicle up to 10 in. long and broad, effuse, long-peduncled, branches long, slender, spreading; bracts obliquely truncate, persistent, bracteoles distant, minute, funnel-shaped, 1–3-fld., persistent; fl. few at the ends of the branches, $\frac{1}{2}$ in. diam., pedicels $\frac{1}{6}$–$\frac{1}{3}$ in.; sep. broad, concave, spreading or reflexed; pet. orbicular; stam. 2–3, staminodes 3–4, head semi-lunar, fil. of all naked; ov. 3-celled, cells 1-ovuled, style very long, slender; capsule $\frac{1}{4}$ in. diam., globose, hirsute, crowned by the long persistent style, coriaceous, not shining; seeds $\frac{1}{10}$ in. long, broadly oblong, plano-convex, reticulately foveolate, white.

Low country; rare. Kukul Korale; Matale East. Fl. Dec., June.

Also in Travancore, E. Bengal, Malay Archipelago.

Clarke, in Mon. 204, quotes the name *A. protensum*, Thw. under *A. zeylanicum*, but the C. P. number here.

A. scapiflorum, Wight, is erroneously given as a Ceylon plant in the Fl. Brit. Ind. (vi. 375).

A. sinicum, Lindl., is also given as a native of Ceylon (Fl. B. Ind. vi. 379). Wight's figure of it, t. 2075 (*A. secundum*, Wight), so closely resembles *A. nudiflorum*, var. *terminale*, as to suggest some confusion with that plant.

4. CYANOTIS, *Don.*

Annual or perennial herbs; l. linear or linear-oblong, sessile; fl. in axillary and terminal scorpioid bracteate cymes, enclosed in large more or less falcate closely imbricating bracteoles, in *C. axillaris* cymes reduced to axillary fascicles of fl. in the l. sheaths; sep. 3, oblong or lanceolate, free or

united at the base; cor. with a campanulate or funnel-shaped tube, formed of the long cohering claws of the pet., and a spreading equally 3-lobed limb; stam. 6, inserted at the base of the cor.-tube; fil. subequal, filiform, contorted in bud, bearded above the middle, fusiform or not beneath the acuminate tip, anth. oblong; ov. 3-celled, cells 2-ovuled, style very slender, bearded or not, fusiform below the acuminate tip, stigma punctiform, ovules superposed, upper erect, lower pendulous; capsule very small, oblong, loculicidally 3-valved, 6-seeded; seeds superposed, subconical, cubical or angular, umbonate at the apex, embryo apical under the umbo.—Sp. 30; 16 in *Fl. B. Ind.*

The species of *Cyanotis* are so very variable in habit and pubescence that probably more Sinhalese specimens than I have had access to are wanted to describe the following species satisfactorily.

Fl. in scorpioid cymes with large imbricating bracteoles.
  Fil. fusiformly thickened below the tip.
    Root-fibres slender.
      Bracteoles dimidiate-ovate, style naked . 1. C. CRISTATA.
      Bracteoles lanceolate, style bearded . . 2. C. OBTUSA.
    Root-fibres stout, cylindric, fleshy, style naked 3. C. TUBEROSA.
  Fil. not thickened below the tip, style naked.
    Stem with a single line of hairs . . . . 4. C. ZEYLANICA.
    Stem glabrous or hairy all round.
      Cymes all terminal . . . . 5. C. VILLOSA.
      Cymes axillary and terminal.
        Pubescence cobwebby . . . . . 6. C. FASCICULATA.
        Pubescence hairy or hirsute . . . . 7. C. PILOSA.
Fl. fascicled, bracteoles concealed in the l. sheaths 8. C. AXILLARIS.

1. **C. cristata,** *Schultes f. Syst.* vii. 1150 (1830). **Bol.-hinda,** *S.* Herm. Mus. 53. Burm. Thes. 94. Fl. Zeyl. n. 32. Clarke, Mon. 247. *Commelina cristata*, Linn. Sp. Pl. 42. *Tradescantia cristata*, Willd. Moon, Cat. 24. Thw. Enum. 323. C. P. 3217.
Fl. B. Ind. vi. 385. Linn. Fl. Zeyl. t. 1. Wight, Ic. t. 2082.

Stem 6–18 in., branched from the base, branches 6–18 in., slender, creeping and rooting below, then ascending, glabrous, or with a line of spreading hairs, internodes 1–3 in.; root fibres very slender; l. rather distant, 1–3 in., spreading, sessile, ovate-oblong, subacute or obtuse, flat, glabrous or sparsely hairy, margins villously ciliate, base rounded or cordate, upper recurved; sheath short, hirsute; bracts $\frac{2}{3}$–$1\frac{1}{2}$ in., ovate-cordate, acuminate, cymes $\frac{1}{2}$–1 in., much longer than the bracteoles, scorpioidly recurved, bracteoles 2-seriate, $\frac{1}{2}$ in., dimidiate-ovate, strongly falcate, acute, glabrous or ciliate with long hairs; sep. lanceolate, acuminate; cor.-tube not much longer than the sep., lobes ovate; fil. fusiform below the tip; style

naked; capsule $\frac{1}{10}$–$\frac{1}{8}$ in., oblong, trigonous, truncate, membranous, nearly glabrous; seeds $\frac{1}{20}$ in. long, trigonous, striate, and with 2 large pits on two of the faces, black.

Low country; a common weed. Fl. April; blue.
Also in India, Burma, Malaya, Mauritius, Trop. Africa.

2. **C. obtusa,** *Trim.* [PLATE XCIV.]
C. arachnoidea, Clarke, var. *obtusa*, Trim. in Journ. Bot. xxiii. 266, and Syst. Cat. 95.
Fl. B. Ind. vi. 386 (*C. arachnoidea* in part).

Whole plant, more or less clothed with white cobwebby wool; stem 1–2 ft. long, very stout, with erect barren and trailing flg. shoots, the latter given off from the lower axils, compressed below, cylindric upwards, internodes about $1\frac{1}{2}$ in.; l. of erect barren shoots many, distichous, closely placed, 9–10 by $1\frac{1}{4}$ in., curved, dorsally rounded, obtuse, subapiculate, slightly floccose beneath and on the margins, thickly coriaceous, bright green and subglaucous above, purplish beneath; l. of flg. shoots 3 by $\frac{3}{4}$ in., oblong, obtuse, apiculate, glabrous above, slightly floccose beneath, often deep red-purple, sheath slightly cobwebby; cymes $\frac{1}{2}$–$\frac{2}{3}$ in., axillary and terminal, sessile or subsessile; bracts short; bracteoles $\frac{1}{4}$–$\frac{1}{3}$ in., dimidiate-ovate-lanceolate, falcate or nearly straight, acute or acuminate; sep. $\frac{1}{6}$ in., lanceolate, acuminate, cobwebby; tube of cor. as long as the sep., lobes ovate-spathulate; fil. and style both bearded and fusiform towards the tip; capsule $\frac{1}{10}$ in., oblong, tip bristly; seeds granular, obscurely pittted.

Rocky places in low country; very rare. Summit of Doluwa Kande, near Kurunegala. Fl. Nov.; bright pale violet-blue.
Endemic (?).
Further observation of this plant convinces me that it is distinct from *C. arachnoidea* of Clarke, but it is included under it in Fl. B. Ind., which does not quote my name, as a var. *obtusa.—Trimen.*
After a careful examination of the specimen and drawing in Herb. Peraden., and comparison with specimens of *C. arachnoidea*, I am disposed to share Mr. Clarke's opinion, and that this may be referable to a very large form of *C. arachnoidea*. Much of the description given above is from notes by Dr. Trimen.—J. D. H.

3. **C. tuberosa,** *Schultes f. Syst.* vii. 1153 (1830), var. **adscendens,** *Clarke, Mon.* 249.
Trim. in Journ. Bot. xxiii. 173, and Syst. Cat. 95. Clarke, Mon. 249.
Fl. B. Ind. vi. 386 (not given for Ceylon). Wight, Ic. t. 2087 (*C. sarmentosa*).

Stem 6 in. to 3 ft., stout or slender, suberect or procumbent and creeping below, more or less hirsute; roots of fleshy cylindric fibres; l. sessile, 6–10 by $\frac{1}{3}$–1 in., upper distant, or in distant fascicles, falcate, shorter, often purple beneath, linear or ensiform, villous, sheath of radical 1 in. long, glabrous, or of

the cauline l. shortly silky; cymes $\frac{1}{2}$–1 in., usually peduncled in the axils of short, ovate, acute leaves, upper often corymbose, strongly falcately decurved; bracteoles $\frac{1}{6}$–$\frac{1}{3}$ in. long, dimidiate-ovate or lanceolate, acute, falcate, villous or densely hirsute; sep. linear-oblong, acute, villous; cor.-tube funnel-shaped; lobes short, rounded; fil. fusiform towards the tips; style naked; capsule $\frac{1}{8}$ in., softly hirsute; seeds conic, obscurely rugose.

Damp sandy ground in dry region; very rare. Kirinde, S. Prov. Fl. Dec.; blue.

Also in Peninsular India.

A most variable plant in habit, foliage, and pubescence. The Ceylon specimens are very poor, much smaller than the Peninsular (from which the description is chiefly taken), and more glabrous, with smaller nearly sessile cymes. I have not seen the style of the Ceylon specimen.—J. D. H.

4. **C. zeylanica,** Hassk. Comm. Ind. 145 (1870).

C. lanceolata and var. *subglabra.* Thw. Enum. 323. Clarke, Mon. 252. C. P. 3223, 3216.

Fl. B. Ind. vi. 387.

Stem elongate, prostrate, rooting at the nodes, branches 6–12 in., erect or ascending, simple or branched, glabrous or with a line of long hairs on one side, leafy; roots fibrous; l. $\frac{1}{2}$–2 in., sessile, narrowly oblong or lanceolate, acuminate, flat, recurved, glabrous above or more or less villous on both surfaces, sometimes densely with long hairs, sheath $\frac{1}{4}$–$\frac{1}{3}$ in., glabrous or villous; cymes small, $\frac{1}{4}$–$\frac{3}{4}$ in., subsessile in terminal heads or solitary; bracts short, acute; bracteoles dimidiate-oblong or -ovate, acuminate, nearly straight, sparsely hairy; sep. $\frac{1}{6}$ in., linear-oblong, obtuse, ciliate; cor.-tube $\frac{1}{3}$ in., funnel-shaped, lobes short, broadly oblong; fil. very long and slender, with a short brush of hairs towards the tip which is not thickened; style naked; caps. $\frac{1}{6}$ in., oblong; seeds striate and obscurely pitted.

Montane zone, 4–6000 ft.; rather common. Hantane, Hunasgiriya, Maturata, Nuwara Eliya. Fl. Oct.–Jan.; pale violet.

Endemic.

5. **C. villosa,** *Schultes f. Syst.* vii. 1155 (1830).

C. lanceolata, Wight, Thw. Enum. 325 (in part). Clarke, Mon. 251. C. P. 2332.

Fl. B. Ind. vi. 387. Wight, Ic. t. 2085 (*C. lanceolata*).

Stem 3–4 ft., from a procumbent base, stout, proliferous and often rooting at the nodes, more or less villous with soft spreading hairs; roots fibrous; l. 3–5 by $\frac{1}{3}$–$\frac{1}{2}$ in., ovate- to oblong-lanceolate, acute or acuminate, glabrous and shining above, flat, hirsute or subsilkily villous beneath, margins silkily ciliate, sheath $\frac{1}{3}$–1 in., glabrous, silky, or villous; bracts short;

ovate, acuminate; cymes $\frac{1}{2}$–$\frac{2}{3}$ in. long, terminal, sessile or peduncled, rarely axillary; bracteoles $\frac{1}{3}$–$\frac{2}{3}$ in. long, dimidiate-ovate, often broadly acuminate, slightly falcate, glabrous or hirsute; sep. lanceolate, acuminate, hirsute; cor.-tube about as long as the sep., lobes ovate-oblong; fil. not thickened below the tip; style naked; capsule oblong, hirsute; seeds subrugose.

Moist region, 2–5000 ft.; rather common. Hantane, Elk Plains, Rangala, Kaputale. Fl. Sept., Oct.

Also in S. India.

Thwaites and Clarke cite Wight's figure of his *C. lanceolata* for this, but I see very little resemblance in the inflorescence between the two plants, that of Wight having axillary cymes with very narrow bracteoles. The foliage is, however, very characteristic in both.—J. D. H.

6. **C. fasciculata,** *Schultes f. Syst.* vii. 1152 (1830).
Thw. Enum. 323. Clarke, Mon. 253. C. P. 2433 (2978 fid. Clarke).
Fl. B. Ind. vi. 387. Wight Ic. t. 2086.

Floccosely silky or cobwebby; stem 4–18 in., diffusely branched from the base; branches slender, spreading, rooting below, leafy; l. 1–2 by $\frac{1}{5}$–$\frac{1}{3}$ in., sessile, linear, linear-lanceolate or narrowed from the base to the tip, acute or acuminate, straight or recurved, cobwebby, rarely glabrate on both surfaces; cymes $\frac{1}{4}$–$\frac{2}{3}$ in., axillary and terminal, sessile; bracts lanceolate, usually longer than the cobwebby cyme; bracteoles $\frac{1}{4}$–$\frac{1}{3}$ in., lanceolate or ovate-lanceolate, falcate, acuminate; sep. ovate-lanceolate, acuminate, cobwebby; cor.-tube short, lobes ovate, obtuse; fil not thickened below the tip; style naked, capsule $\frac{1}{6}$ in., broadly oblong, 3-gonous, angles woolly; seeds oblong, faintly rugose.

Exposed rocky ground in moist and dry region, and up to 4000 ft.; common. Fl. March, Oct.; bright violet-blue.

Also in S. India.

C. Thwaitesii, Hassk. Comm. Ind. 136 (*C. fasciculata, var. δ, Thwaitesii*, Clarke, Mon. 252), is described by its author from a specimen communicated by Thwaites to the Herbarium of M. Lenormand. I find nothing in Herb. Peraden. answering to the description. The pubescence is said to be cobwebby, as in *C. fasciculata*, from which it differs in the umbellate cymes, lanceolate bracteoles, and fusiform tips of the fil.—J. D. H.

7. **C. pilosa,** *Schultes f. Syst.* vii. 1155 (1830) (non Wight).
Thw. Enum. 323. Clarke, Mon. 251. C. P. 2331.
Fl. B. Ind. vi. 387.

Stem 8 in. by 2 ft., very stout below, suberect or geniculately ascending, dichotomously branched, glabrous, hairy, or villous, lower nodes rooting; roots of rather fleshy fibres; l. sessile, 4–8 by $\frac{1}{6}$–$\frac{1}{3}$ in., linear, acuminate, flat or subcomplicate, falcately spreading, glabrous or softly hairy on one or

both surfaces, margins naked or silkily villous, base narrowed into a broad sacciform sheath ¼–1 in. long; cymes chiefly terminal, capitate, ¼–1 in. diam., sessile or shortly peduncled, glabrous or villous; bracts broadly ovate or ovate-lanceolate, hardly exceeding the bracteoles which are ⅓ in. long, dimidiate-ovate or ovate-lanceolate, acuminate; sep. oblong-lanceolate, acuminate, hirsute; cor.-tube about as long as the sep., lobes rounded; fil. not thickened towards the tip; style naked; capsule shortly oblong, obtuse, hispid; seeds obconic, sub-rugose.

Among grass on the patanas in montane zone; very common. Fl. all the year; brilliant pale blue.

Also on the Nilgiri Mts.

Wight's *C. pilosa* (Ic. Pl. Ind. or t. 2083) cited for this by Thwaites, is a species with cobwebby white pubescence, and has a bearded style. Clarke cites it under his *C. arachnoidea.*—J. D. H.

8. **C. axillaris,** *Schultes f. Syst.* vii. 1154 (1830).

Tradescantia axillaris, L. Moon, Cat. 24. Thw. Enum. 323. C. P. 2330.

Fl. B. Ind. vi. 388. Roxb. Cor. Pl. t. 107.

Stem 6–18 in., stout or slender, diffusely branched, leafy, branches suberect and creeping below, or prostrate, glabrous or sparsely hairy, internodes 1–3 in.; roots fibrous; l. sessile, 2–6 by ⅙–⅓ in., narrowly linear or linear-lanceolate, acute or acuminate, flat, glabrous or hairy, sheath ¼–⅓ in., mouth ciliate; cymes reduced to axillary fascicles of flowers with the small linear or linear-lanceolate bracteoles almost concealed in the l.-sheaths; sep. ⅓ in. long, spathulately lanceolate, acuminate, sparingly hairy; cor.-tube ⅓ in. long, lobes small, rounded; fil. fusiform below the tip; style bearded; capsule ⅕–¼ in. long, shortly stipitate, long-beaked, quite glabrous, beak half as long as the body; seeds large, up to $\frac{1}{10}$ in. long, oblong, compressed, or ventrally concave, brown, shining, cancellate, with shallow pits.

Low country in both regions; common. Fl. March, October; bright violet-blue.

Throughout E. Asia, Australia.

5. FLOSCOPA, *Lour.*

Erect or subscandent herbs; l. lanceolate; fl. secund, in terminal or axillary thyrsiform panicled cymes; sep. 3, oblong, membranous, concave, persistent; pet. free, unequal, marcescent, one narrower than the others; stam. 6, all perfect, fil. filiform, naked; ov. shortly stipitate, 2-celled, cells 1-ovuled, style filiform, stigma minute; capsule very shortly stipitate,

subglobosely didymous, subcompressed, thinly crustaceous, loculicidally 2-valved, 2-seeded; seeds flattened on one side, dorsally umbonate, with the embryo under the umbo.—Sp. 11; 1 in *Fl. B. Ind.*

F. scandens, *Lour. Fl. Cochinch.* 193 (1790).
Tradescantia paniculata, Roxb. Moon, Cat. 24. *F. paniculata*, Hassk., Thw. Enum. 323. Clarke, Mon. 265. C. P. 553.
Fl. B. Ind. vi. 390. Wight Ic. t. 2079 and 2080 (*Dithyrocarpus petiolatus*, *D. Rothii* and *D. undulatus*).

Stem 1–2 ft., rather slender, naked below with long internodes, rooting at the nodes; branches ascending, leafy above, glabrous or pubescent; roots of stout fibres; l. subpetioled, 2-6 by $\frac{1}{2}$–$1\frac{1}{2}$ in., lanceolate, acuminate, scaberulous above, beneath glabrate or pubescent, base narrowed, sheath glabrous or villous, mouth fringed with long hairs; panicle terminal, sessile or shortly peduncled, erect, subpyramidal, villous or hirsute, branches (cymes) 1–2 in. long, slender, ascending, shortly stipitate, many-fld.; fl. pedicelled, small, subglobose, lower bracteate, bracteoles minute; sep. broad, villous; pet. broadly obovate; fil. longer than the pet., anth. didymous; ov. glabrous; capsule rather broader than long, shining, $\frac{1}{12}$–$\frac{1}{6}$ in. diam., abruptly subacute at both ends; seeds pale, glaucous, dorsally transversely wrinkled.

Shady places in moist low country; rather common. Fl. Dec.–Feb.; pale pink.
Also throughout E. Asia and Trop. Australia.

CXXXVII.—FLAGELLARIACEÆ.

Tall perennials, erect or climbing; l. alt., elongate, with many parallel veins, flat or plicate, sometimes ending in a tendril; fl. small, green or pale, uni- or bisexual, in shortly peduncled, terminal, much-branched panicles; bracts at the base of the panicle leafy, floral minute or 0; fl. small, perianth inferior, rotate, 6-partite, segments sub-biseriate, subequal, imbricate in bud, persistent; stam. 6, hypogynous or inserted on the bases of the segments, fil. filiform, free, anth. erect dehiscent introrsely; ov. superior, 3-celled, cells 1-ovuled, style short, 3-cleft, or styles 3, or stigmas sessile, ovules anatropous; fr. small, globose, indehiscent, more or less fleshy, 3-celled or with 1–2 pyrenes; seeds various, embryo minute, in floury endosperm.

Fl. unisexual, l. cirrhiferous . . . . . . 1. FLAGELLARIA.
Fl. diœcious, l. simple . . . . . . 2. SUSUM.

1. **FLAGELLARIA,** *L.*

Lofty climbers; l. caudate-acuminate, terminated by a spiral cirrhus; fl. bisexual; fr. a small globose drupe with a fleshy sarcocarp, and 1–3 1-seeded pyrenes.—Sp. 2; 1 in *Fl. B. Ind.*

F. indica, *L. Sp. Pl.* 333 (1753). **Goyi-wel,** *S.*
Herm. Mus. 22, 30. Burm. Thes. 35, 138. Fl. Zeyl. n. 133. Moon, Cat. 30. Thw. Enum. 340. C. P. 2301.
Fl. B. Ind. vi. 391. Rheede, Hort. Mal. vii. t. 53. Gaertn. Fruct. i. t. 16, f. 9.

Quite glabrous; stem climbing lofty trees by the l. tendrils, nearly 1 in. thick towards the base, terete, smooth, branches clothed with cylindric, smooth, closed, truncate sheaths; branchlets as thick as a crow-quill; l. sessile, 6–10 in., variable in breadth, lanceolate from a rounded base, narrowed into a slender spirally tipped tail, midrib very slender, sheath cylindric; panicle shortly peduncled, 6–18 in. long, loosely irregularly branched; bracts scale-like; fl. $\frac{1}{10}$–$\frac{1}{6}$ in. diam., globose, sessile, solitary or clustered on the slender spiciform branchlets; outer perianth-segm. ovate-oblong, unequal; inner orbicular; anth. as long as the fil., deeply 2-fid at the base; ov. narrow, trigonous; drupe pisiform, red.

Low country, below 1000 ft.; rather common. Fl. Dec.; white.
Through Trop. Asia, Africa, and Australia.

2. **SUSUM,*** *Bl.*

Stem stout, erect from a creeping rootstock; l. very long, acuminate; fl. diœcious, outer perianth-segm. orbicular, concave, inner petaloid; male fl.:—stam. 6, inserted on the base of the perianth-segms., pistillode 3–6-angled or lobed; fl. fem.:—staminodes small or 0, stigmas 3, globose, connate in a 3-lobed disk; fr. a 1–3-seeded berry, with the persistent stigmas excentric or lateral.—Sp. 2; 1 in *Fl. B. Ind.*

S. anthelminticum, *Bl. in Schultes f. Syst.* vii. 1493 (1830). **Induru,** *S.*
Thw. Enum. 340. C. P. 2738.
Fl. B. Ind. vi. 391.

Glabrous, or young l. and panicle sparsely cottony; rootstock very long, prostrate in mud, $\frac{3}{4}$ in. diam., subcompressed,

* Name from σοῦσον, a lily.

spongy, internodes short; stem 3–5 ft., stout, leafy throughout, or leafless below; l. 2–3 ft., lanceolate, acuminate, flat, coriaceous, closely veined and cross-venuled, midrib broad, convex beneath, petiole 1–3 ft., base sheathing; panicle 3–4 ft. high, shortly, very stoutly peduncled, very broad, decompound, rhachis and branches stout, branchlets spreading and recurved; bracts at the lower axils 8 in., ensiform, upper smaller; fl. about $\frac{1}{8}$ in. diam., rather distant, sessile, green; fil. short, dilated below, anth. oblong; berry pisiform, usually 1-seeded, dark purple, shining.

Ponds and wet places in moist low country, mostly below 1000 ft.; rather rare, but locally abundant. Kalutara (MacRae), Kitalgalle, Ratnapura, Munemalwatte, Pasdun Korale. Fl. March; green.

Also in Malaya.

The long flagelliform shoots float in the water; the large erect panicle is very handsome and palm-like.

CXXXVIII.—JUNCACEÆ.

Erect, rarely annual, glabrous herbs; stems tufted, usually on a short creeping rootstock; l. terete or compressed, or reduced to sheaths; fl. small, bisexual, in axillary or terminal cymes, bracteate; perianth inferior, 6-partite, persistent, segm. biseriate, subequal, narrow, coriaceous or thin, often brown and shining, imbricate in bud; stam. 3 or 6, inserted on the bases of the segm., fil. long or short, anth. basifixed, dehiscing introrsely; ov. 1- or 3-celled, cells many-ovuled, style long or short, stigmas 3, filiform, ov. anatropous; capsule 1–3-celled, loculicidally 3-valved; seeds erect, oblong, testa thin, embryo small in dense endosperm.

JUNCUS, *L.*

For characters, see Order.—Sp. about 150; 26 in *Fl. B. Ind.*

Stem leafless . . . . 1. J. EFFUSUS.
Stem leafy . . . . 2. J. PRISMATOCARPUS.

1. **J. effusus,** *Linn. Sp. Pl.* 326 (1753).

J. glaucus, Thw. Enum. 340. Trim. Syst. Cat. 96 (non Ehrh.). C. P. 1003.

Fl. B. Ind. vi. 392. Reichb. Ic. Fl. Germ. t. 920.

Densely tufted in often circular masses; rootstock short, stout, creeping; stems 1–2 ft., $\frac{1}{8}$–$\frac{1}{6}$ in. diam., terete, finely striate, tips pungent, sheathed at the base with scales, pith continuous, l. 0; cymes lateral on the stem, an inch or more

below the top, effuse or more or less contracted, branches unequal, 1–2 in. long, slender; fl. fascicled, $\frac{1}{10}$–$\frac{1}{8}$ in. long, bracts ovate, scarious; perianth-segments subequal, subulate-lanceolate, acuminate, coriaceous, stam. 3; capsule oblong or obovoid, trigonous, truncate and retuse, pale brown, shining, rather shorter than the perianth; seeds very many, narrowly oblong, testa pale brown, striate, thickened at the lower end.

Upper montane zone; common. Fl. Feb., &c.

Also in Himalaya and Nilgiri Mts., and in Europe, Australia, and N. and S. America.

The Ceylon plant long supposed to be *J. glaucus* by Thwaites and subsequent authors (including Fl. B. Ind.), is correctly referred to *J. effusus*, L., by Buchenau (Engl. Bot. Jahrb. i. 104).

2. **J. prismatocarpus,** *Br. Prod. Fl. Nov. Holl.* 259 (1810).
J. Leschenaultii, J. Gay, Thw. Enum. 340.
Fl. B. Ind. vi. 395.

Very variable in size and habit; rootstock short, tufted; stems 18–24 in., erect or decumbent and rooting at the nodes, terete or compressed, leafy, pith continuous; l. 2–10 by $\frac{1}{16}$–$\frac{1}{8}$ in., shorter than the stem, distinctly septate when dry, narrowly linear, acuminate, compressed, spongy within; cymes terminal, irregularly compound, of many 6–10-fld. sessile and peduncled bracteate heads of fl.; bracts leafy, erect, shorter than the cyme, bracteoles lanceolate, long-acuminate, hyaline; fl. sessile, green or brown; perianth-segm. $\frac{1}{8}$–$\frac{1}{6}$ in., subulate or linear-lanceolate, glumaceous, acuminate; stam. 3, fil. very short, anth. oblong; style short, stigmas long; capsule longer than the perianth, prismatic; seeds obovoid or ellipsoid, very minute, testa appressed, reticulate, not produced at either end.

Wet places in the montane zone; very common. Fl. all the year; green or brownish.

Also throughout India, and in Burma, E. Asia, Australia.

CXXXIX.—PALMEÆ.

Shrubs or trees, solitary or gregarious, unarmed, or armed with straight or recurved spines; stem erect, scandent, or decumbent, simple or branched above, solid; l. alternate, scattered, or crowded toward the top of the stem or trunk, plaited in bud, pinnatisect or palmatisect, rarely simple or bipinnately multisect, veins parallel; fl. uni- or bisexual, small, green or yellowish, in an axillary or terminal panicle or spike

(spadix), which are at first enclosed in one or more coriaceous or woody spathes, usually bibracteate; perianth inferior, segm. 6, biseriate, imbricate or valvate in bud; stam. 3 or 6, rarely more, inserted at the base of the perianth, fil. long or short, anth. versatile; ov. 1–3-celled, or of 1–3 free or connate carpels, cells 1–2-ovuled, stigmas 3, usually sessile, ovules variously inserted, anatropous; fr. a 1–3-celled drupe or berry, or of 1–3 indehiscent carpels, pericarp various, sometimes covered with hard polished scales imbricating downwards; seeds various, raphe usually branching over the whole surface of the testa, embryo small, near the surface of a copious endosperm.

L. pinnatisect.
  L. simply pinnatisect.
    Sides of leaflets reduplicate in vernation.
      Spadix inserted below the l.
        Stigma terminal in fr.
          Stam. 3 or 6 . . . . 1. ARECA.
          Stam. 9–12 . . . . 2. LOXOCOCCUS.
        Stigma lateral or basal in fr. . . . . . 3. ONCOSPERMA.
      Spadix interfoliar.
        Epicarp smooth, naked . . . . . . 10. COCOS.
        Epicarp covered with shining scales . . 8. CALAMUS.
      Spadix terminal . . . . 5. NIPA.
    Sides of leaflets induplicate in vernation . . 6. PHŒNIX.
  L. decompound . . . . 4. CARYOTA.
L. fan-shaped.
  Spadix terminal . . . . 7. CORYPHA.
  Spadix interfoliar . . . . 9. BORASSUS.

The key to the genera of Palms given above is an artificial one. I hence supplement it by their natural arrangement, as followed in this work, but which does not lend itself to the construction of such keys as are adopted for most of the other Orders.

Tribe 1. **Areceæ.** L. simply pinnatisect, leaflets with reduplicate sides in vernation; fr. not clothed with scales.—1, *Areca;* 2, *Loxococcus;* 3, *Oncosperma;* 4, *Caryota;* 5, *Nipa.*

Tribe 2. **Phœniceæ.** L. pinnatisect, leaflets with induplicate sides in vernation; ov. of 3 separate carpels.—6, *Phœnix.*

Tribe 3. **Corypheæ.** L. flabelliform, segm. free or connate, sides induplicate in vernation, ov. of 3 separate carpels.—7, *Corypha.*

Tribe 4. **Lepidocaryeæ.** L. pinnatisect, leaflets with reduplicate sides in vernation; fr. tessellate with reflexed shining scales.—8, *Calamus.*

Tribe 5. **Borasseæ.** L. flabelliform, segm. connate, sides induplicate in vernation, ov. 3-celled.—9, *Borassus.*

Tribe 6. **Cocoineæ.** L. pinnatisect, sides of leaflets reduplicate in vernation; ov. 3-celled; fr. with a woody 1-seeded endocarp, having 3 basal holes, opposite to one of which the embryo is placed.—10, *Cocos.*

1. **ARECA,*** *Linn.*

Trunk slender, erect, annulate; l. pinnatisect, leaflets reduplicate-plicate; spadix infrafoliar, branched, monœcious, branches spiciform, pendulous, with many solitary male fl. on the branches of the spadix, and few fem. at the base; spathes 3 or more, caducous, upper bracteiform, bracts 0 or minute; male fl. minute, compressed, sep. small, pet. longer, lanceolate, valvate; stam. 3 or 6, hypogynous, anth. basifixed; fem. fl. much larger, sep. and pet. orbicular, imbricate, pet. with valvate tips; ov. 1-celled, stigmas 3, sessile, ovule basal, erect; fr. ovoid or oblong, stigmas terminal; seed sub-hemispheric, base truncate, endosperm ruminate, embryo basilar.—Sp. about 25; 4 in *Fl. B. Ind.*

Trunk 40–80 ft. . . . . 1. A. CATECHU.
Stem 8–12 ft. . . . . 2. A. CONCINNA.

1. **A. Catechu,**† *L. Sp. Pl.* 1189 (1753). **Puwak,** *S.* **Kamukai,** *T.*

Herm. Mus. 51. Burm. Thes. 182. Fl. Zeyl. n. 392. Moon, Cat. 66. Thw. Enum. 327. C. P. 3471.

Fl. B. Ind. vi. 405. Roxb. Cor. Pl. t. 75. Ann. Jard. Buitenz. i. t. 1 and 3, f. 2.

All parts glabrous; trunk 40–80 ft. by 8–16 in. diam., straight, cylindric, of equal thickness throughout, grey; l. 4–6 ft., erecto-patent and recurved, leaflets numerous, crowded, 1–2 ft., linear to linear-lanceolate, many-veined, lower finely acuminate, upper præmorse or bifid, uppermost confluent; sheath long, smooth; spathes simple, compressed, glabrous; spadix infrafoliar, very shortly peduncled, 12–18 in. long or more, branched paniculately at the base, rhachis short, stout, compressed, smooth, branches filiform, terminating in pendulous male spikes; male fl. small, more or less distichous, sep. 3, minute, triangular; pet. much longer, oblong, rigid, striate; fil. very short, triangular, anth. sagittate, pistillode 3-fid; fem. fl. 1–3 at the bases of the branches or in their axils, much larger than the male, sep. $\frac{1}{3}$ in. long, ovate-cordate, obtuse; pet. like the sep., but rather longer, staminodes forming a 6-toothed membrane; fr. $1\frac{1}{2}$–2 in. long, ovoid, orange or scarlet; seed ovoidly hemispheric, about $\frac{3}{4}$ in. diam.

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* The name of the seed in Malabar, *Adakka*, introduced by the Portuguese.

† Name from a resinous extract from the seed, resembling that produced by *Acacia Catechu*, in Bengal.

Very commonly cultivated in the low country, but nowhere wild.

Throughout Trop. Asia, but always cultivated, and it is not now possible to tell where it originated.

The nut supplies the well-known masticatory with betel leaves. It has medicinal properties, chiefly as an astringent and vermifuge; catechu is not made from it in Ceylon.

2. **A. concinna,** *Thw. Enum.* 328 (1864). **Lén-teri,** *S.*
A. Dicksonii, Roxb. (?), Moon, Cat. 66. C. P. 620.
Fl. B. Ind. vi. 406. Ann. Jard. Buitenz. i. t. 2 and 3, f. 1.

Trunk 8–12 ft. by $1\frac{1}{2}$–$1\frac{3}{4}$ in. diam., cylindric, green; l. few, 3–$3\frac{1}{2}$ ft., spreading, leaflets 2 ft. by $2\frac{1}{2}$ in. broad, lanceolate, falcate, caudate-acuminate, subglabrous, lower simple, 1-costate, upper of 2 or more confluent, acuminate or toothed at the apex, terminal shorter, more or less confluent in toothed laminæ; sheath 16 in. long; spadix branched, a foot or more long, very shortly peduncled; infl. as in *A. Catechu;* male fl. biseriate, $\frac{1}{10}$ in. long, sep. oblong, obtuse; pet. nearly thrice as long, obliquely ovate-lanceolate, acuminate, striate; stam. 6, anth. subsessile, linear-oblong acute, cells parallel, pistillode trigonous; fem. fl. $\frac{1}{6}$–$\frac{1}{4}$ in. long, cal. an obscure unequally 3-lobed cup; pet. broadly ovate-oblong, obtuse; fr. $1\frac{1}{2}$ in. long, subfusiformly ovoid, umbonate.

Forests in the moist low country; rather rare. Subaragamuwa (Moon), Reigam Korale, Pasdun Korale. Fl. Sept.

Endemic.

The fruit is a brilliant scarlet. This is no doubt the 'Puwakghaha Lenatæsi' of Herm. Mus. 66, and Burm. Thes. 183.

This is occasionally planted, but the fruits, which are also chewed with betel, like *A. Catechu*, are generally obtained from wild trees.

2. **LOXOCOCCUS,** *Wendl. and Drude.*

Trunk tall, erect, cylindric, annulate; l. pinnatisect, leaflets linear, obliquely truncate, reduplicate-plicate; spathes 2, cymbiform; spadix infrafoliar, monœcious, branched; fl. ternate, mostly in clusters of a fem. between 2 males, spirally arranged round the branches; male fl.:—sep. 3, orbicular, imbricate; pet. 3, much larger, ovate, valvate; stam. 9–12, fil. very short, anth. subversatile, pistillode minute, ovoid; fem. fl. smaller than the male, subglobose, sep. orbicular, broadly imbricate, persistent, pet. ovate, broadly imbricate, tips valvate, staminodes 0; ov. 1-celled, stigmas 3, minute, ovule parietal; fr. subglobose, cuspidately beaked, stigmas terminal, endosperm ruminate, embryo subbasilar.—Monotypic.

L. rupicola, *Wendl. and Dr. in Linnæa*, xxxix. 185 (1875). **Dotalu,** *S.*

Caryota mitis (?) Moon, Cat. 64. *Ptychosperma rupicola.* Thw. Enum. 328. C. P. 2732.
Fl. B. Ind. vi. 413. Bot. Mag. t. 6358.

Trunk 30-40 ft. by $1\frac{1}{2}$ in. diam., dull green, base swollen, soboliferous ; l. about 10, 5-6 ft. long, by about 3-4 broad, petiole $1-1\frac{1}{2}$ ft., with a short green sheathing base ; leaflets 12-20 pairs, rather distant, spreading and decurved, sessile, linear, tip obliquely truncate and notched, bright green above, glaucous and sparsely furfuraceous beneath, terminal one or two pairs confluent; lower spathe 12 in. long, narrowly cymbiform, coriaceous, pale brown, dotted with peltate furfuraceous scales; spadix 12 in. long, triangular in outline, coral red, quite smooth, ped. short, stout, annulate, branches erecto-patent; fl. blood red ; male fl. about $\frac{1}{2}$ in. diam., fil. stout, equalling the linear anth., pistillode minute, trifid; fem. fl. ovoid; ov. obliquely ovoid, ovule pendulous; fr. about $\frac{3}{4}$ in. diam., smooth, sarcocarp fibrous.

On cliffs and rocks in the moist region, from 1000-5000 ft.; rather common. Fl. Feb.; spadix fl. and fr. blood-red.
Endemic.
The seed is used for mastication with betel, like that of the *Arecas.*

3. **ONCOSPERMA,** *Bl.*

Trunk tall, spinous, annulate ; l. terminal, pinnatisect, leaflets narrow, in 2 or more series, sides reduplicate; spathes 2, complete, ensiform, caducous; spadix infrafoliar, branched, monœcious, fl. sessile, spirally crowded on the branches, the upper solitary, male, the lower ternate, a fem. between 2 males; male fl. asymmetric, sep. suborbicular, acute, imbricate, pet. obliquely ovate, valvate; stam. 6-12, pistillode columnar, 3-fid; fem. fl. globose, sep. and pet. orbicular, imbricate, staminodes 6; ov. obliquely ovoid, 1-3-celled, stigmas minute, ovule parietal; fr. small, globose, stigmas lateral or subbasal; seed suborbicular, raphe broad, endosperm deeply ruminate.—Sp. 4; 3 in *Fl. B. Ind.*

O. fasciculatum, *Thw. Enum.* 328 (1864). **Katu-Kitul,** *S.*
Caryota horrida, Moon, Cat. 64 (non Willd.). C. P. 2337.
Fl. B. Ind. vi. 415.

Trunk 30-50 ft., 5-6 in. diam., copiously armed with long flexible, black, compressed spines, base thickened, stoloniferous; l. 8 ft. long, leaflets 12-18 by $1-1\frac{3}{4}$ in., fascicled, lanceolate, caudate-acuminate, tips drooping, scurfy beneath, rhachis scurfy, petiole spinous towards the base, sheath $2\frac{1}{2}$ ft., spinous, scurfy; spathes unarmed, sparsely scurfy, inner 2-crested;

spadix 2 ft. long, unarmed, ped. very stout, branches drooping; male fl. $\frac{1}{4}$ in. long, densely imbricate; sep. very small; pet. acute, striate; stam. 9, fil. short, broad, fleshy, anth. linear; fem. fl. scattered, $\frac{1}{6}$ in. diam.; sep. thick, forming a broadly 3-lobed cup; pet. hardly longer than the sep., coriaceous, broader than long; fr. globose, $\frac{1}{2}$ in. diam., black or purple.

Steep forests in moist region, 1–5000 ft.; rather common. Fl. Feb., March.

Endemic.

The prickly stems are a great hindrance in climbing the steep hill-sides where this grows. The fruit is exactly like large black currants.

4. CARYOTA,* *Linn.*

Tall unarmed palms, trunk annulate, flowering when full grown from the axils of the leaves beginning with the upper and thence successively downward, a male and fem. spadix alternately, then dying; l. few, large, broad, bipinnatisect or decompound, leaflets cuneiform, sessile, sides reduplicate in vernation, bases swollen; spathes 3–5, incomplete, tubular; spadix interfoliar, shortly peduncled, much fastigiately branched, branches slender, pendulous; fl. crowded, male solitary, or binate with an interposed fem.; sep. orbicular, imbricate; pet. much longer, linear-oblong, connate at the base, valvate, stam. very many, fil. short, anth. long, pistillode 0; fl. fem. subglobose, sep. orbicular, imbricate, pet. short, staminodes 3 or 6; ov. obovoid, trigonous, 3-celled, stigma 3-lobed, ovule erect; fr. globose, 1–3-seeded, stigmas terminal, sarcocarp full of raphides; seed erect, embryo dorsal in ruminated endosperm.—Sp. 14; 3 in *Fl. B. Ind.*

C. urens,† *L. Sp. Pl.* 1189 (1753). **Kitul,** *S.* **Tippilipana,** *T.*
Herm. Mus. 44. Burm. Thes. 186. Fl. Zeyl. n. 396. Thw. Enum. 329. Moon, Cat. 64. C. P. 3742.

Fl. B. Ind. vi. 422. Rheede, Hort. Mal. i. t. 11. Gaertn. Fruct. i. t. 7, f. 3.

Trunk 40–60 ft. by 1 ft. or more diam., cylindric, annulate, not soboliferous; l. 18–20 by 10–15 ft., primary divisions 5–6 ft., arched and drooping, leaflets 4–8 in., fascicled or alternate, cuneiform, obliquely truncate, irregularly serrate-toothed on the truncate margin, upper margin produced beyond the leaflets into a tail, flabellately veined, quite glabrous, bright green, shining, margins at the base recurved,

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* The Greek name for a kind of date.

† From the very hot burning taste of the fruit.

petiole very stout; sheath smooth with fibrous netted margins; spadix 10–12 ft. long, the branches simple, forming a dense tassel drooping from the very stout short ped.; spathes closely embracing the ped. of the spadix; male fl. cylindric when closed, $\frac{1}{2}$ in. long, pet. coriaceous, concave; anth. acuminate; fr. $\frac{2}{3}$–$\frac{3}{4}$ in. diam., pericarp acrid; seeds 1 or 2.

Low country, chiefly in the moist region, to about 3000 ft.; common. Fl. March (?); fr. red or yellow.

Throughout Tropical Asia.

Though encouraged and protected, I believe this to be a real native here. Yields toddy copiously. The sago-like pith forms a valuable article of food, and a coarse sugar is made from the toddy. The wood, which is silicious, is useful for building purposes. Leaves yield the kittul fibre of commerce.

5. NIPA, *Wurmb.*

Rootstock stout, prostrate, branched; clothed with the sheaths of old leaves, leafing and flowering at the ends of the branches; l. pinnatisect, leaflets linear-lanceolate, sides reduplicate in vernation; spadix short, terminal, erect in fl., branches and ped. stout, sheathed with spathes; fl. monœcious, male in catkin-like branches of the spadix, fem. crowded in a terminal head, perianth glumaceous; male fl. surrounded with setaceous bracteoles; sep. linear with broad truncate inflexed tips, imbricate; pet. smaller; stam. 3, fil. connate in a very short column, anth. elongate, basifixed, pistillode 0; fl. fem. much larger than the male, perianth-segm. 6, irregularly disposed, rudimentary, staminodes 0; carpels 3, connate, tips free with an oblique stigmatic line, ovules erect; fr. a large globose syncarp, of many obovoid, hexagonal, 1-celled, 1-seeded carpels with pyramidal tips, pericarp fleshy and fibrous, endocarp spongy and floury; seed erect, grooved on one side, testa coriaceous viscid within, hilum broad, endosperm horny, equable, hollow, embryo basilar, obconic.—Monotypic.

N. fruticans, *Wurm. in Verh. Bat. Genootsch.* i. 349 (1779). **Gin-pol,** *S.*

Moon, Cat. 66. Thw. Enum. 327. C. P. 3333.
Fl. B. Ind. vi. 424. Griff. Ic. Pl. Asiat. tt. 244–7.

Rootstock $1\frac{1}{2}$ ft. diam., rooting along the lower surface; l. very many, erect and recurved, 15 ft. long and upwards, petiole 4–5 ft., very stout, sheath short, leaflets innumerable, shortly decurrent on the rhachis, 4–5 ft. long, bright green above, glaucous and 3-keeled beneath, tip subulate, midrib

scurfy; spadix 4–7 ft., ped. 3–4 ft.; male fl. very small, sep. linear with clavate inflexed tips, pet. similar but narrower; anth. linear; ov. densely crowded, cuneate-obovate, angled, top pyramidal; fr. 1 ft. diam., nodding, carpels densely packed on a globose, areolate receptacle 4–6 in. long, compressed, broadly cuneiform, dark brown, crown 3- or more-angled; seed as large as a hen's egg.

Mouth of rivers on South-west Coast; very rare. Kalutara, Gindura River, near Galle. Fl. October.

Sunderbunds, Burma, throughout Malaya to Queensland; not in Peninsular India.

This is called the water-cocoanut, and looks quite like one with its stem submerged. This common Malayan plant seems to reach its western limit here. The floating fruits are carried out to sea by the rivers.

6. **PHŒNIX,** *Linn.*

Tall or short, diœcious palms; l. pinnatisect, sides of leaflets induplicate in vernation; spadices usually several, interfoliar, erect or drooping in fr., branched; spathe complete, hard, compressed; male fl.:—calyx cupular, 3-toothed; pet. 3, much longer, obliquely ovate, valvate; stam. 3–9, fil. subulate, anth. dorsifixed, pistillode minute or 0; fem. fl. globose, cal. of male accrescent; pet. orbicular, imbricate, staminodes 6 or a 6-toothed cup; ov. of 3, free, 1-celled carpels, stigmas sessile, uncinate, ovules erect; fr. a single, oblong, terete, 1-seeded carpel, stigma terminal, pericarp fleshy, endocarp membranous; seed oblong, ventrally deeply grooved, groove branching into 2 arms in the centre of the seed, endosperm equable or subruminate, embryo dorsal or subbasilar.—Sp. 11; 8 in *Fl. B. Ind.*

Arboreous . . . . 1. P. ZEYLANICA.
Frutescent . . . . 2. P. FARINIFERA.

1. **P. zeylanica,** *Trim. in Journ. Bot.* xxiii. 267 (1885). **Indi,** *S.* Herm. Mus. 66 and 69. Burm. Thes. 183. Fl. Zeyl. n. 397. *Elate sylvestris*, L. Sp. Pl. 1189 (for the most part); Moon, Cat. 63. *P. sylvestris*, Thw. Enum. 329 (non Roxb.). *P. pusilla*, Becc. Malesia, iii. 408 (non Gaertn.). C. P. 3172.

Fl. B. Ind. vi. 425. Malesia t. 44, f. 5. (*P. pusilla*).

Stem 8–20 ft.; l. rather short; leaflets very many, quadrifariously inserted, subequidistant, 7–10 in. long, linear-lanceolate, pungent, coriaceous, concave, spreading at right angles, bright green; spathe 8–14 in. long, keel furfuraceous; spadix a foot long or more, young scopiform, ped. stout, rhachis flattened, branches of male 4–6 in. long, of fem. longer; male fl. $\frac{1}{6}$ in. long; stam. 6, anth. subsessile, linear; fem. spadix

long-peduncled, ped. 1 in. broad, flattened, branches 6–10 in., divergent in fr.; fem. fl. scattered, globose, $\frac{1}{8}$ in. diam., cal. cupular; pet. orbicular; fr. about $\frac{1}{2}$ in. by $\frac{1}{4}$ diam., obovoid-oblong, apiculate, red, at length violet-blue; seed nearly as long as the fr., groove dilating into a canal in the axis of the endosperm.

Moist low country; very common, especially on Southern Coast. Fl. Feb.; yellowish.

Endemic.

Beccari (Malesia, iii. 409) refers to this *P. pusilla*, Gaertn. (and adopts that name), which seems to me to belong rather to the next. The stem of *P. zeylanica* sometimes attains 20 ft. in height, and is often characteristic of the scenery after burning off the scrubby surrounding growth for chena-cultivation. Mats and boxes are made of the leaves. The sweet pulp of the fruit is eaten.

2. **P. pusilla,** *Gaertn. Fruct.* i. 24 (1788).

Trim. in Journ. Linn. Soc. xxiii. 173. **Inchu,** *T.*

P. farinifera, Roxb.; Beccari, Malesia, iii. 404. Moon, Cat. 69.

Fl. B. Ind. vi. 426 (*P. farinifera*). Gaertn. Fruct. t. 9 (fruit only). Roxb. Cor. Pl. t. 74 (*P. farinifera*). Becc. l. c. t. 44, f. 3 (*P. farinifera*).

Stem very short, stoloniferous, thickly clothed with old leaf-sheaths; l. 4–5 ft. long, petiole short, with one or more leaflets reduced to rigid spines 2 in. long, rhachis strongly laterally compressed, leaflets, sub-quadrifarious, and sub-opposite, 8–12 by $\frac{1}{2}$–$\frac{3}{4}$ in., divaricate, ensiform, pungent, concave, smooth, pale green, lowest pairs spinescent; spathe 6 in. long, keel furfuraceous; spadix 8–12 in., erect, branches simple, of male suberect, of fem. spreading, ped. of fem. spadix elongating in fr., branches 6–8 in. long; male fl. $\frac{1}{6}$ in. long; pet. broadly ovate-obtuse; fem. fl. $\frac{1}{6}$ in. long; sep. strongly 3-ribbed; fr. $\frac{1}{2}$ in., oval or oblong-ovoid, obtuse, apiculate, dull purple-black, young bright crimson, shining, pericarp fleshy, sweet; seed oblong, polished.

In forests in the dry region; very common. Fl. March, April.

Also in S. India (*P. farinifera*).

I believe this to be identical with *P. farinifera*, Roxb. Beccari will not allow that Gaertner's *P. pusilla* could have been this plant, as he thinks it does not grow in the parts of Ceylon in possession of the Dutch in Hermann's time; indeed, when I first recorded the plant, I had seen it only from Anuradhapura, and therefore Beccari has supposed it to be very rare in Ceylon; but now I find it to be universal in the sandy forests of the north, all the coast-towns of which were held by the Dutch at the end of the seventeenth century. As for the character, Beccari finds in Gaertner's figure of having deeper and larger arms to the bifid excavation in the endosperm, which thus more resembles *P. zeylanica;* this is too variable (as seen in Beccari's own figures) to be of much value. This never forms any stem whatever, and Gaertner's specific name is thus very characteristic.—*Trimen.*

In the Peninsula of India *P. farinifera* attains a height of stem of 4 ft., and contains a floury substance used as food in times of scarcity. The split petioles are used for basket work, and the leaflets for making sleeping mats.—J. D. H.

7. **CORYPHA,** *L.*

Unarmed palms, dying after once flg. and frg.; l. terminal, very large, palmately or flabellately, multifid, segm. induplicate in vernation; spadix a very large, terminal, erect, decompound panicle; spathes many, tubular; fl. small, bisexual; calyx cupular, 3-fid; pet. 3, connate below in a stipes, ovate, acute, imbricate or subvalvate; stam. 6, fil. subulate, anth. dorsifixed; ov. deeply 3-lobed, 3-celled, style short, subulate, stigma minute, 3-fid, ovules erect, anatropous; fr. of 1–3 fleshy globose drupes, styles basilar; seeds erect, globose, embryo at the summit of the equable horny endosperm.—Sp. 8; 3 in *Fl. B. Ind.*

C. umbraculifera, *L. Sp. Pl.* 1187 (1753). **Tala,** *S.*

Herm. Mus. 54. Burm. Thes. 181. Fl. Zeyl. n. 394. Moon, Cat. 26. Thw. Enum. 329. C. P. 2336.

Fl. B. Ind. vi. 428. Hort. Mal. iii. tt. 1–7. Gaertn. Fruct. t. 7 (fruit).

Trunk erect, straight, cylindric, 30–80 ft. high by 2–3 ft. diam., annulate; l. 8–16 ft. diam., plicate, cleft to about the middle into 80–100 linear-lanceolate acute or bifid lobes; petiole 5–10 ft., very stout, margins armed with short compressed dark-col'd. spines; spadix pyramidal, 10–20 ft. high, decompound, shortly stoutly peduncled, ped. clothed with tubular spathes which the primary branches pierce, branchlets forming pendulous spikes; cal. broadly 3-toothed; pet. oblong, about $\frac{1}{12}$ in. long; drupe shortly stipitate, globose, $1\frac{1}{2}$ in. diam., 2-celled with two small arrested carpels at its base, greyish olive-col'd., roughish.

Moist region below 2000 ft.; rather common. Fl. Nov.-Jan.

Also in Malabar.

This must be a native palm, but I have never seen it in original jungle. Of the vast number of seedlings which come up near the parent tree, very few arrive at maturity, the young leaves being continually cut. Beddome remarks that he has never seen it wild in S. India.

The largest and most imposing of Eastern Palms, flowering when about 40 years old. The young fruit, pounded, is used for stupefying fish. The leaves form mats, fans, and umbrellas, and are also used for writing upon. A bread is made of the pounded soft interior of the trunk. The seeds have the hardness of ivory, and are known as Bayarbatú nuts; they are used as beads in Ceylon, and in the manufacture of buttons in Europe.

8. CALAMUS, *Linn.*

Perennial armed palms, rarely erect, usually climbing by means of hooked spines on the rhachis of the l., or by whip-like spinous prolongations (flagella) of the rhachis, or of the spadix, or of the l. sheath; stem simple, cylindric, ringed at the nodes, upper internodes clothed with spinous l. sheaths; l. pinnatisect, rarely digitate, leaflets few or many, lanceolate, rarely broad; spadices axillary, elongate, much branched, armed, sometimes produced into a spinous flagellum; spathes tubular or open, sheathing the ped. and branches of the spadix, and passing into bracts and bracteoles (spathels and spathellules); fl. small, usually polygamo-diœcious, often secund or distichous, forming scorpioid spikes or spikelets; fl. small, perianth coriaceous; male fl.:—cal. tubular, 3-lobed or- toothed, coriaceous; pet. 3, acute, coriaceous, valvate, sometimes combined at the base into a stipes; stam. 6, fil. short, anth. dorsifixed, versatile; fem. fl. slightly accrescent, cal. of the male; pet. 3, valvate; staminodes connate in a cup; ov. incompletely 3-celled, clothed with retrorse scales, style short or long, stigmas 3, ovule basilar, erect; fr. globose or ellipsoid, usually strongly beaked, style terminal, pericarp thin, clothed with appressed, closely imbricate, deflexed, polished scales; seed smooth or pitted, endosperm equable or ruminate, embryo ventral or basal.—Sp. 160–170; 72 in *Fl. B. Ind.*

It is not possible to describe the species of *Calamus* satisfactorily from Herbarium specimens. This can be done only from living materials. I know of no genus of flowering plants presenting such great variety in infl. and floral organs, to which is to be added in armature of sheath, petiole, rhachis, spathes, spadix, and flagella. To describe all these organs even briefly for any one species would take much space, and materials do not exist in the Kew and Peradeniya Herbaria for even attempting this for a single Ceylon species. I am therefore obliged to confine the following account of them to the more conspicuous characters of the leading organs, availing myself of the labours of Dr. Beccari (in the Flora of British India), and some MS. notes on a few species found amongst Dr. Trimen's papers.

Rachis of l. not flagelliferous.
  Stem erect . . . . 1. C. THWAITESII.
  Stem climbing.
    Leaflets many.
      Male pet. connate in a stipes . . . . 2. C. PSEUDO-TENUIS.
      Male pet. not stipitate.
        Stem short . . . . 3. C. ROTANG.
        Stem slender.
          Fr. with a large beak . . . . 4. C. RIVALIS.

Fr. with a short conical beak . . 5. C. DELICATULUS.
Leaflets few.
Leaflets 3-veined . . . . . . 6. C. RADIATUS.
Leaflets 5-veined.
L. pinnate . . . . 7. C. PACHYSTEMONUS.
L. digitate . . . . 8. C. DIGITATUS.
Rachis of l. flagelliferous.
Fr. globose . . . . 9. C. ZEYLANICUS.
Fr. obovoid or ovoid . . . . . . 10. C. OVOIDEUS.

1. **C. Thwaitesii,** *Becc. in Fl. B. Ind.* vi. 441 (1892).
C. longisetus, Thw. Enum. 330 (non Griff.). C. P. 2873.
Fl. B. Ind. vi. 441.

Stem erect, stout, $1\frac{1}{2}$ in. diam.; l. sheaths closely set with oblique raised lines, the lines thickly set with flattened very stiff, sharp, shining, deflexed ovate-lanceolate or ensiform spines 1–2 in. long, and with smaller, narrower, erect ones below each line of large ones; l. $4\frac{1}{2}$ ft. long, petiole 7–12 in. long, stout, channelled above, set with imperfect rings of flat spines, rhachis with a raised ridge, set beneath with half rings of straight, slightly deflexed dark brown spines, not produced into a flagellum; leaflets many, 2–$2\frac{1}{2}$ ft. by $1\frac{1}{2}$–2 in., equidistant or fascicled, very acute, margin ciliate and spinulose, 3-veined beneath with the midrib retrorsely spinulose; male spadix up to 20 ft., very slender, with very long flagella set with half-whorls of short, deflexed, hooked spines; male fl. ovoid, $\frac{1}{5}$–$\frac{1}{4}$ in. long; cal. broadly, 3-lobed, lobes rounded; pet. ovate-oblong, sessile; fil. very broad, narrowed at the top into a geniculate tip carrying the long versatile anther; fem. spadix with stouter branches; fem. fl. $\frac{1}{3}$ in. long; sep. and pet. enlarged in fr.; fr. seated on the sessile enlarged perianth, 1 in. long, oval-ovoid, beak stout, conical, straight, scales rather large, tumid, with a narrow dark brown border, shallowly channelled in the centre, 5–6 superposed on each vertical row, dull, orange yellow.

Moist low country, below 2000 ft.; rather rare. Kalutara (Moon); Kandy, Hantane; Rambukkama; Kurunegala. Fl. Feb.–May. Endemic (?).

Description partly from Beccari, partly from notes made by Dr. Trimen in May, 1896.—J. D. H.

2. **C. Pseudo-tenuis,** *Becc. in Fl. B. Ind.* vi. 445 (1892).
C. tenuis, Thw. Enum. 330 (non Roxb.). C. P. 2335.
Fl. B. Ind. vi. 445.

Stem slender, scandent; sheaths set with many unequal, straight, flat, very sharp spines 1 in. long and shorter; l. about 4 ft. long, petiole 8 in., with a few solitary short spreading spines, rhachis not produced into a flagellum, armed with scattered

slender flat spines, young scurfy; flagellum of sheath very long, slender, compressed below, thin, cylindric and set with half rings of deflexed hooked spines; leaflets 50 or more, nearly equidistant, 8–12 by ¾–1 in., linear, acuminate, thin, margins setulose, veins 3, remotely setulose on the upper surface; male spadix, spikes long, slender, decurved; spathels funnel-shaped, acuminate; male fl. 2–3 together, minute, subglobose; cal. cupular, striate, lobes acute; pet. sessile, short, polished; fil. very short; fem. spadix very long, slender, branches distant, armed with short deflexed spines; spathes flattened, lower elongate, tubular, 2-edged; fr. ovoid, ⅓–½ in. diam., beak stout, conical, scales 9–12 in a vertical row, rounded, dull yellow, margins brown, scarious, centre not channelled, endosperm subruminate, embryo basilar.

Low country; rare (?). Matale (Thwaites); Lady Horton's Walk. Fl. Jan.–April.

Also in S. India.

Description in part from Dr. Trimen's notes of a plant growing in Lady Horton's Walk, May, 1896.—J. D. H.

3. **C. Rotang,*** *L. Sp. Pl.* 325 (1753). **Wéwel,** *S.* **Priampu,** *T.*
Herm. Mus. 59. Burm. Thes. 36. Fl. Zeyl. n. 468. Moon, Cat. 26. *C. Roxburghii*, Griff., Thw. Enum. 330. C. P. 3388.
Fl. B. Ind. vi. 447. Griff. Palms Brit. Ind. t. 195A, and t. 112, 192 (*C. Roxburghii*), and t. 195A (*C. fascicularis*).

Stem very slender, scandent; sheaths flagelliferous, sparingly armed with short flat spines; l. 1½–2 ft., petiole very short, stout, margined with small straight or recurved spines with conical laterally compressed bases; leaflets very many, equidistant, lower 8–12 by ⅓–½ in., upper gradually smaller, linear-lanceolate, acuminate, 3-veined, veins naked above or bearing distant bristles sometimes ¼ in. long, midrib alone setose beneath, margins setulose; male spadix very long, decompound, flagelliferous, sparingly spinous; spathes elongate, tubular, lower 6–10 by nearly ⅔ in. diam., sparingly armed with scattered recurved spines, upper unarmed, scurfy; spikes 1–1½ in., recurved or revolute, bracteoles densely crowded, cymbiform; male fl. secund in 3–4 series, ⅛ in. long, cal. cupular, base thickened, striate, lobes broad, acute; pet. sessile, smooth, acute; fil. very short, subulate; fem. fl. $\frac{1}{10}$ in. long, scattered along the slender branches of the spadix, cal. conical, tubular, 3-toothed, base dilated, truncate; pet. sessile, tips only exserted; fr. seated on the minute perianth, subglobose, ½ in. diam., mucronate, scales many in a vertical

* The Malay name.

series, pale yellow with a very narrow thin discoloured margin and shallow median channel.

Dry region; common in wet places. Fl. Feb., March.
Also in Peninsular India.

4. **C. rivalis,** *Thw. ex Trim. in Journ. Bot.* xxiii. 268 (1885). **Ela-wel,** *S.*
C. P. 3914.
Fl. B. Ind. vi. 441.

Stem slender, scandent; sheaths flagelliferous, copiously armed with straight, flat, lanceolate and subulate, pale spines $\frac{1}{2}$–1 in. long; l. about 3 ft. long, petiole armed below with flat and above with stout recurved spines; rhachis not produced into a flagellum scurfy, armed with short recurved spines; leaflets numerous, 12–18 by $\frac{1}{2}$–$\frac{2}{3}$ in., equidistant, linear-lanceolate, coriaceous, margins setulose, 3-costate beneath, smooth or midrib remotely setulose; spadix very long, slender, armed with short recurved spines and terminated by a clawed flagellum; lower spathes or all armed with very short spines, mouth of lowest dilated, lacerate; male spikes 1–1$\frac{1}{2}$ in., recurved, spathels coriaceous, very obliquely cup-shaped, acute; male fl. distichous, crowded, about $\frac{1}{6}$ in. long, cal. 3-fid to the middle, cupular; pet. and stam. confluent in a stipes, fil. filiform, anth. oblong; fem. fl. in larger spikes, less crowded than the males; fr. $\frac{1}{3}$ in. long, broadly ellipsoid with a large conical truncate beak, scales broader than long, about 10 in a vertical series, not channelled, pale yellow, bordered with red-brown.

Moist low country; rare. Pasdun Korale (Thwaites); Colombo (Ferguson). Fl. Sept.
Endemic.

5. **C. delicatulus,** *Thw. Enum.* 330 and 431 (1864). **Narawel,** *S.*
C. P. 3159.
Fl. B. Ind. vi. 446.

Stem slender, scandent, internodes with a tuft of erect, white, hair-like prickles 1–2$\frac{1}{2}$ in. long below the nodes; sheaths flagelliferous, sparsely scurfy, beset with many, spreading, flattened, white, short and long linear spines up to 4–5 in. long; l. 2–3 ft., petiole of lower 2 ft., of upper very short, both furnished with a few hooked spines, rhachis not produced into a flagellum, scurfy, and with a few straight spines; leaflets many, equidistant, close-set, 8–10 by $\frac{1}{2}$ in., linear-lanceolate, finely acuminate or acute, and hair-pointed, 3-veined, margins and veins on both surfaces with a few long black bristles; spathes tubular, truncate, unarmed, mouth ciliate, spathels tubular, imbricate, truncate, spathellules cupular, minute; spadix polygamo-

diœcious, very long, filiform, decompound, beset with small hooked spines, flg. branches about 18, 1–5 in. long; spikes very slender, male fl. rather distant, about $\frac{1}{8}$ in. long; cal. urceolate, 5-toothed; pet. twice as long, oblong, acute, bases connate; fil. rather long; fem. fl.:—pet. hardly longer than the cal.; ov. oblong, seated in a 6-toothed cup; fr. (immature?) subglobose, $\frac{1}{2}$ in. diam., beak conical, not long, scales about 8 in a vertical series, ochraceous, with a very dark brown border, centre not channelled.

Moist country below 1000 ft.; rather rare. Galle; Hiniduma; Pasdun Korale. Fl. Dec.–May.
Endemic.

6. **C. radiatus,** *Thw. Enum.* 431 (1864). **Kukula-wel,** *S.*
C. P. 3805.
Fl. B. Ind. vi. 442.

Stem very slender, scandent; sheaths flagelliferous, densely armed with short acicular spines which are free or are connate below in transverse ridges mixed with long bristles, upper transversely rugose; l. radiately 6–8-foliolate; petiole 2–4 in., and rhachis rather slender, bearing small scattered recurved spines; leaflets 8–12 by $\frac{2}{3}$ in., linear, acuminate, thin, 3-veined, midrib beneath and margins quite smooth; spathes few, very long, clavately funnel-shaped, cuspidate; spadix polygamo-diœcious, very long, slender, decompound, armed with small recurved spines, primary branches 2–6, 2–3 ft. long, spikes $\frac{1}{2}$–$\frac{2}{3}$ in., rather distant, reflexed, 3–15 fld., naked; spathels and spathellules cup-shaped; male fl.:—cal. short, cylindric, striate; pet. much longer, connate below in a short tube; fil. conical, tip subulate, straight, pistillode oblong, 3-fid; fem. fl. $\frac{1}{10}$ in. long; cal. cupular, lobes broad, acute, striate, pet. short, acute, striate; fr. seated on the slightly enlarged perianth, globose, $\frac{1}{3}$ in. diam., shortly beaked, scales about 8 in a vertical series, broadly triangular, dull yellow with narrow red-brown entire margins, and an obscure median channel; endosperm ruminate, embryo basilar.

Moist low country below 1000 ft.; rather common. Hiniduma; Hewesse; Kalutara. Fl. Feb.; March.
Endemic.

7. **C. pachystemonus,** *Thw. Enum.* 431 (in part) (1864).
C. P. 2334 (partly).
Fl. B. Ind. vi. 442.

Stem slender, scandent; sheaths sparingly tubercled and armed with small flattened pale spines; l. 1–2 ft., pinnate, upper bifoliolate, petiole short, slender, and rhachis armed with solitary, stout, recurved spines, rhachis about 3–7 in.

long, not flagelliferous; leaflets 4–7, irregularly disposed, 5–12 by ½–2½ in., oval, subacute, or obtusely acuminate, 3–5-veined, margins and midrib beneath smooth, cross-venules distinct, upper pair sometimes connate with a spinous rhachis; spathes funnel-shaped, truncate, cuspidate, armed with small prickles, spathels and spathellules cupular or patelliform; spadix very long, slender, decompound, branches few, spikes many, alternate, ¼–⅓ in. long, crowded, scorpioidly recurved; male fl. in many series, ⅙ in. long, linear, curved; cal. cupular, striate, lobes short, obtuse; pet. twice as long, linear-oblong, acute, striate, connate in a column at the base; fil. thickened at the base, then subulate, tip not inflected; fr. unknown.

Moist low country below 1000 ft.; rare. Kukul Korale; Kalutara. Fl. Nov. Dec.

Endemic.

Confounded by Thwaites with *C. digitatus.*

8. **C. digitatus,** *Becc. in Fl. B. Ind.* vi. 442 (1892). **Kukula-wel,** *S.*

C. pachystemonus, Thw. Enum. 431 (in part). C. P. 2334 (partly).
Fl. B. Ind. vi. 442.

Stem very slender, scandent; sheath not flagelliferous? copiously beset with long and short, strong, straight, flat spines and conical shorter ones, mouth with a rather large ochrea; petiole 6–8 in., slender, and rhachis furfuraceous, unarmed or with a few distant, recurved, large or small spines; l. digitately 2–4-foliolate, leaflets 8–12 by 1–3 in., oblanceolate, cuspidately acuminate, 3–7-veined, base scurfy beneath, margins and veins smooth, upper pair sometimes confluent with a spinous rhachis for half their length; lower spathe elongate, cylindric, unarmed, upper very slender, mouth truncate, entire; spadix very long, slender, decompound, very sparingly spinous, branches distant; spikes very many, ½–1 in., spathels short, patelliform, imbricate; male fl. ⅛ in. long, cal. tubular, striate, lobes short; pet. twice as long or more, narrow, straight or falcately curved, connate at the base; fil. very short, conical, tip subulate, straight; fr. seated on the slightly enlarged perianth, globose, ⅓ in. diam., pale yellow, beak very small, scales 6–7 in a vertical series, very broad with scarious brown margins and an obscure channel in the middle; endosperm subruminate, embryo basilar.

Moist low country below 1000 ft.; rather rare. Reigam and Pasdun Korales; Hiniduma; Galle. Fl. March.

Endemic.

Thwaites at first thought this to be *C. gracilis*, Roxb. (Enum. 330).

9. **C. zeylanicus,** *Becc. in Fl. B. Ind.* vi. 455 (1893). **Ma-wéwel, Wanderu-wel,** *S.*

C. rudentum, Moon, Cat. 26; Thw. Enum. 330 (non Lour.). C. P. 2874.

Fl. B. Ind. vi. 455.

Stem very stout, scandent; sheaths not flagelliferous; l. 4–5 ft. long, petiole stout, armed with 3-fid recurved spines, rhachis very stout, and its stout flagellum armed with large, broad, decurved, palmately 5–10-cleft, claw-like, woody spines broader than the rhachis, young scurfy; leaflets many, equidistant, $1\frac{1}{2}$–2 ft. by 1–$1\frac{1}{2}$ in., ensiform, long, acuminate, veins 3–5, very sparingly setulose above, naked beneath; lower spathe acute, armed with very short scattered spines, upper striate, unarmed or sparcely spinous, uppermost funnel-shaped, truncate; male spadix decompound, the long spreading spikes with short spathels bearing short broad flat spikelets, $\frac{1}{2}$–1 in. long, of most closely imbricate spathellules; fem. spadix very stout, with much longer spikes; fl. deeply sunk in the truncate spathellules, ovoid, nearly $\frac{1}{4}$ in. long; cal. deeply 3-lobed; pet. broad, connate at the base, both striate; fr. seated on the enlarged perianth, globose, $\frac{3}{4}$ in. diam., yellow-brown, beak long, stout, conical, scales 8 or 10 in a vertical series, tumid, with narrow white furfuraceous margins and a deep central channel; seed globose, endosperm deeply ruminate, embryo lateral.

Moist low country; rather common below 1500 ft. Kalutara (Moon); Sabaragamuwa frequent.

Endemic.

10. **C. ovoideus,** *Thw. ex Trim. in Journ. Bot.* xxiii. 269 (1885). **Tambutu-wel,** *S.*

C. P. 3925.

Fl. B. Ind. vi. 457.

Stem stout, scandent; l. 14 ft., including the flagellum, and more; leaflets 10–24 by $\frac{1}{4}$–1 in., equidistant, alternate, broadly linear, acuminate, tip bristly, 3-veined, setulose beneath, margins smooth, rhachis fugaciously scurfy, margins prickly, dorsally rounded, with solitary hooked spines, flagellum armed with short, broad, many-toothed spines, sheath densely armed with rings of flattened, deflexed, often lacerate, black spines; lower spathes armed with short, black, reflexed spines; fl. not seen; fr. seated on the shortly pedicelled slightly enlarged perianth, $\frac{3}{4}$ in. long, obovoid, strongly beaked, scales 10–12 in a vertical series, tumid, deeply channelled in the centre, pale yellowish-grey, bordered with orange-brown.

Moist low country; rare. Sabaragamuwa, 1866 (Thwaites).

Endemic.

The specimens are insufficient for a good description.

9. BORASSUS,* *Linn.*

A tall diœcious palm; l. fan-shaped, plicate, sides of lobes induplicate in vernation; spadix interfoliar, very large, simply branched, ped. sheathed with open spathes, male with stout cylindric branches, densely clothed with imbricating bracts, fem. sparingly branched, few-fld.; male fl. biseriate in small scorpioid spikelets enclosed in the bracts, secund; perianth glumaceous; sep. and pet. 3 each, imbricate; stam. 6, pistillode of 3 bristles; fem. fl. large, globose, perianth fleshy, greatly accrescent in fr.; sep. imbricate; pet. convolute, staminodes 6–9; ov. globose, entire or 3–4-cleft, 3–4 celled, stigmas 3, ovules basilar, erect; fr. subglobose, with 1–3 obcordate compressed pyrenes, stigmas terminal; seeds compressed, quadrate, top 3-lobed, embryo apical in the equable hollow endosperm.—Monotypic.

***B. flabellifer,** *L. Sp. Pl.* 1187 (1753). **Tal,** *S.* **Panai,** *T.*

Herm. Mus. 49. Burm. Thes. 181. Fl. Zeyl. n. 395. *B. flabelliformis*, L. Syst. Veg. ed. 13, 829; Moon, Cat. 69; Thw. Enum. 329. *Lontarus domestica*, Gaertn. Fruct. i. 2. C. P. 3743.

Fl. B. Ind. vi. 482. Rheede, Hort. Mal. i. t. 9 (fem.), and t. 10 (male). Rumph. Herb. Amb. i. t. 10. Gaertn. Fruct. i. t. 8 (*Lontarus*). Roxb. Cor. Pl. tt. 71, 72.

Trunk 60–70 ft. high by 2–3 diam., black, scarred above, swollen above the middle and again contracted upwards; l. 6–10 ft. diam., palmately fan-shaped, rigidly coriaceous, many-cleft into lanceolate or linear 2-fid lobes 2–4 ft. long with spinulose margins, petiole stout, with spinous margins, ligule short; male and fem. spadix several ft. long, branches cylindric; male fl. mixed with scaly bracteoles, exserted seriatim from the bracts as the spikes lengthen; sep. narrowly cuneate, tip truncate, inflexed; pet. shorter, obovate-spathulate; anth. large, subsessile, oblong; fem. fl. 1 in. diam., sep. fleshy, reniform, pet. smaller; ov. subtrigonous, stigmas sesssile, recurved; drupe broadly obovoid, 8 in. diam., seated on the greatly enlarged perianth, mesocarp fleshy and fibrous, pyrenes 2½ in. broad, black; testa adherent to the endocarp.

Dry region, especially in the desert sandy tracts near the coast; very common, but always planted. Fl. March, April.

Cultivated in India, Burma, Malaya, apparently wild in Trop. Africa. This is usually known as the Palmyra, the Portuguese 'Palmeira' slightly altered in spelling. It is grown in vast groves, like the cocoanut, in the north of Ceylon, especially in Jaffna District, as is noticed by Rumph. (l. c. 48).

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* Βόρασσος is the name of the fruit of a palm given by Dioscorides.

For a very full account of the uses of this palm in Ceylon, reference may be made to 'The Palmyra Palm,' by W. Ferguson, printed at Colombo in 1850 (reprinted 1888).

10. **COCOS,*** *Linn.*

Unarmed, erect, monœcious palms; l. pinnatisect, leaflets narrow, sides reduplicate in vernation; spadix at first erect, simply panicled, branches drooping, elongate, many-fld., usually with solitary male fl. in the upper part, and with solitary fem. or 2 males and an interposed fem. in the lower part; spathes 2 or more, elongate, simple, lower woody; male fl.:—sep. 3, small, valvate, pet. 3, valvate, stam. 6, pistillode minute or 0; fem. fl.:—much larger, sep. and pet. 3 each, orbicular, convolute, staminodes a fleshy disk; ov. 3-celled (2 empty), style very short, stigmas 3, ovule subbasilar; fr. large, ovoid, trigonous, 1-seeded, style terminal, pericarp thick, fibrous, endocarp bony or stony, with 3 basal pits, indicating the 3 cells of the ov.; seed cohering with the endocarp, embryo small in fleshy or horny endosperm, opposite to one of the pits.—Sp. 30; 1 in *Fl. B. Ind.*

*__C. nucifera,__ *L. Sp. Pl.* 1188 (1753). **Pol,** *S.* **Tennai,** *T.*
Herm. Mus. 50. Burm. Thes. 182. Fl. Zeyl. n. 391. Moon, Cat. 63. Thw. Enum. 330. C. P. 3744.
Fl. B. Ind. vi. 482. Hort. Mal. i. tt. 1–4.

Trunk 40–80 ft., 1–2 ft. diam., thickened and ascending at the base, inclined, black, rarely forked; l. 12–18 ft., leaflets 2–3 ft., linear-lanceolate, acuminate, flaccid, bright green, petiole 3–5 ft., stout, unarmed; spadix 4–6 ft. straw-col'd., simply branched, shortly stoutly peduncled, branches flexuous, densely fascicled; spathe 2–3 ft., narrowly oblong, tapering at both ends, glabrous or downy, splitting longitudinally; male fl. small, yellowish; sep. $\frac{1}{12}$ in., ovate, acute; pet. $\frac{1}{4}$ in., oblong-lanceolate; fil. subulate, anth. linear, erect; fem. fl. few, bibracteolate; sep. about 1 in., concave, pet. rather smaller; ov. seated on an orange-col'd. disk; fr. trigonously obovoid, oblong or subglobose, 6–10 in. long, endosperm forming a thick white layer of a fleshy fibrous oily substance, adherent to the membranous testa, which again is adherent to the almost stony black endocarp.

Universally cultivated throughout the low country, especially near or on the sea-coast, but not wild.

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* From the Portuguese name Coco or Coquo, given to the fruit from a fancied resemblance to a monkey's face.

Cultivated throughout the Tropics, the origin not known. [Indigenous, according to Kurz, in the Cocos and Andaman Is.—J. D. H.]

Several varieties are recognised by growers. 'Tembili' has the endosperm pink in colour, and is called the 'King Coconut.' A very small-fruited dwarf sort (*C. nana*, Griff.) goes by the name of the 'Maldive' Coco-nut.*

CXL.—PANDANACEÆ.

TREES or shrubs, erect, or scandent by aerial roots; l. usually trifarious, alt., long, narrow, acuminate, or caudate, margins and keel spinous; fl. diœcious, in axillary or terminal simple or branched globose or cylindric spadices which are surrounded by leafy spathes or bracts and bracteoles; perianth 0; male fl.:—stam. many, collected in fascicles, or spicate, fil. free or connate, anth. erect, basifixed, pistillode 0 or minute; fem. fl.:—naked, staminodes minute or 0; ov. sessile, collected in fascicles, free or connate, stigmas sessile or subsessile, ovules solitary and suberect, or many on parietal placentas anatropous; fr. an oblong or globose syncarp of free, or more or less connate, or confluent, 1- or more-celled, woody or fleshy, angular carpels separating from a central columnar receptacle, or marcescent with it; seeds minute, embryo very minute, in hard endosperm.

Stem erect or procumbent . . . . 1. PANDANUS.
Stem climbing . . . . 2. FREYCINETIA.

1. PANDANUS, *Linn. f.*

Small trees or shrubs; stem sometimes very short, erect or procumbent, and rooting; l. very long, spirally arranged at the ends of the branches, base sheathing; spadices terminal, solitary, spicate or panicled; fl. diœcious; stam. fascicled on the spadix, fil. long or short, anth. sessile; fem. crowded on a globose or oblong receptacle, free or confluent, 1-celled, crown thickened, stigma simple or forked, ovules 1 in each cell, ascending from the base of a parietal placenta; fr. a globose or oblong syncarp, of woody or fleshy thick-walled drupes which are deciduous singly or in masses from a fleshy receptacle; seeds erect, fusiform..—Sp. 150 (reputed); 15 in *Fl. B. Ind.*

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* Not to be confounded with the *Cocos maldivica* of the old writers, which was the fruit of *Lodoicea Seychellarum*, the 'Double Coconut' or 'Coco-de-mer' (a palm peculiar to the Seychelle Is.), carried by the ocean currents and often cast on the shores of the Maldives.

Fem. spadix solitary.
  Anth. subulate, stigma depressed . . . 1. P. ODORATISSIMUS.
  Anth. oblong, stigma prominent . . . 2. P. ZEYLANICUS.
Fem. spadices spicate, stigma uncinate . . 3. P. FŒTIDUS.

1. **P. odoratissimus,** *L. f. Suppl. Pl.* 424 (1781). **Mudu-kéyiya,** *S.* **Talai,** *T.*

Herm. Mus. 55 (Wœthakejija). Burm. Thes. 20. Fl. Zeyl. n. 131 (*Bromelia*). Moon, Cat. 67. Thw. Enum. 327. *P. fascicularis*, Lam., Trim. Syst. Cat. 97. C. P. 3739.

Fl. B. Ind. vi. 485 (*P. fascicularis*). Rheede, Hort. Mal. ii. tt. 1 and 6. Roxb. Cor. Pl. tt. 94–96.

Shrubby, 15–20 ft. high; stem rooting above the ground; branches 1 in. diam. and upwards, spreading, supported by stout aerial roots; l. 3–5 ft., ensiform, caudate-acuminate, coriaceous, marginal spines pointing forward, those on the midrib beneath pointing forward or backwards; male infl. of a stout, elongate, pendulous, terminal rhachis bearing spadices of fl. in the axils of large white lanceolate coriaceous spathiform bracts 4–12 in. long; male spadices 3–4 in. long by 1–1½ in. diam., subsessile, cylindric, consisting of a very stout rhachis giving off densely crowded short spiciform branches clothed with stam., anth. longer than the slender fil., sagittately lanceolate, caudate-acuminate, base of cells rounded; fem. spadix solitary, 2 in. diam., enclosed in spathiform yellow bracts like those of the male infl., but stricter; carpels confluent in obpyramidal groups of 6–10 or fewer, green, stigmas short, reniform, yellow; fr. an oblong or globose orange or scarlet syncarp, 6–10 in. long and broad, carpels 2–3 in. long, turbinate, angular, confluent, crown smooth, convex, more or less depressed around the reniform stigmas.

On the sea-coast, usually forming a belt above high-water mark; very common all round the island. Fl. rainy season; male spadix very fragrant.

Throughout the shores of Trop. Asia, Polynesia, and Mauritius.

There is a good drawing of Hermann's but no specimen, and Linnæus never named the plant. Linn. fil. obtained his specimens from Thunberg, collected in Ceylon in 1777–8. His name has three years' precedence over Lamarck's.—*Trimen.*

There is some uncertainty about the name which this Ceylon plant should bear. According to Roxburgh (Fl. Ind. iii. 738) the l. of *P. odoratissimus* are smooth and glossy; but, according to Kurz (For. Fl. ii. 508), they are 'almost whitish glaucous or glaucous green.'—J. D. H.

2. **P. zeylanicus,** *Solms in Linnæa*, xlii. 16 (1878). **O-keyiya,** *S.*
P. furcatus, Thw. Enum. 327 (non Roxb.). C. P. 2734.
Fl. B. Ind. vi. 484 (*ceylanicus*).

Stems very slender, tall, tufted, about 1 in. diam., sparingly branched; l. 3–4 ft. by 1 in., lanceolate, caudate, margins and keel distantly spinulose, marginal spinules upcurved; male

infl. of a stout flexuous pendulous rhachis 6–10 in. long, bearing spadices of fl. in the axils of pale yellow spathiform bracts with green caudate tips; male spadices 3–4 in. long, cylindric, consisting of a stout rhachis clothed with short, stout pedicels, (confluent fil.) ½ in. long, terminated by a cluster of oblong apiculate anth. $\frac{1}{10}$ in. long; fem. spadix solitary, sessile; carpels ⅔ in. long, clavate, angular, acute, stigma unguiculate, simple or 2-toothed; syncarp nearly globose, 5–6 in. diam., green, drupes angular, crown rounded, tipped by the large coriaceous incurved stigma.

In running water, beds of streams, and often planted on borders of paddy fields in moist region; common. Fl. Feb., March.

Endemic.

Kurz (Journ. Bot. v. 102) quotes this C. P. number for *P. furcatus*, Roxb., and Balfour (Journ. Linn. Soc. xvii. 47) refers it doubtfully to the same species, but it is very distinct,

3. **P. fœtidus,** *Roxb. Fl. Ind.* iii. 742 (1832), var. **racemosus,** *Kurz* in Journ. As. Soc. Beng. xxxviii. 150 (1869) (sp.) **Dumu-keyiya,** *S.* *P. humilis*, Moon, Cat. 67; Thw. Enum. 327. C. P. 3740.

Fl. B. Ind. vi. 483 (not given for Ceylon). Freyc. Voy. t. xxvi. f. 1–9. (*Foullioya racemosa*, Gaud.)

A densely branched shrub, 3–6 ft. high, with prostrate soboliferous stem; l. 4–6 ft. by 3–4 in., thickly coriaceous, glaucous green, glossy above, closely minutely reticulate on both surfaces with (when dry) raised venules, spinous on the margins, midrib beneath, and sometimes on the veins, spines $\frac{1}{12}$ in. distant, strongly incurved, or recurved on the midrib; male infl. a short flexuous pendulous rhachis ½ in. diam.; spathes yellow, glossy, margin and midrib finely spinulose-ciliate, lower up to 1 ft. long, abruptly acute; male spadices sessile in the spathes, 6–10 in. long, consisting of a fleshy rhachilla, densely clothed with slender subulate flexuous anth. ⅓ in. long; fem. infl. like the male, but erect, rhachis zigzag; spadices 6–7, ovoid, about 1¼ in. long; carpels closely packed, free, linear, polygonal, terminating in a stiff sharp beak with a narrow stigmatic line running from apex to base; ripe syncarps 5–7 in a pendulous cluster, 3½–4½ in. long, sessile, globose or ovoid, subtrigonous, prickly, pale glaucous yellowish green, fetid; carpels connate below by their glutinous pericarps, crowns nipple-shaped, angular, terminated by the spinescent upcurved stigmas.—Chiefly from notes by Dr. Trimen.

Moist low country; common, but usually planted as a fence for paddy fields. Fl. March.

Solms (l. c. 9) is my authority for placing this under *P. fœtidus*, Roxb. Balfour (l. c. 58, 67) refers it doubtfully to *P. polycephalus*, Lam. Kurz quotes (l. c. 101) this C. P. number for his *P. affinis* with doubt. The

Fl. B. Ind. puts it at end of the genus as imperfectly known. Kurz founded his *P. racemosus* on the plate (t. 26, f. 1–9) of *Foullioya racemosa* in Gaudichaud's voyage, which does not show the fruit. No text of the latter work was ever published, and the locality is hence unknown. The fruits as well as the flowers have a disagreeable scent.—*Trimen.*

There is another *Pandanus* commonly used about Colombo for fencing paddy fields which I have referred (Journ. Bot. xxiii. 174) to *P. Kaida*, Kurz, as it precisely agrees with the figures in Hort. Mal. ii. t. 2–5, on which that species is founded. I have seen only female plants, and the seeds do not ripen. It is therefore probably imported. Like the other species when used for fences, it is called 'Wetta-kaiya.'—*Trimen.*

I find the following notes upon this plant amongst Dr. Trimen's MS.:—'L. broadish, bright light green, glaucous above, marginal spines very strong, upcurved, those on midrib beneath hooked backward in the lower part, forward in the upper; fem. spikes ½-3 in. long, oblong-ovoid, slightly trigonous; fl. about 10, irregularly placed, quite separable from base to apex, each composed of 2–3 flat-topped, 5–6-angled carpels separated by a groove, stigma sessile, flat, or somewhat 2-lobed, rather reniform; syncarp orange, ovoid-oblong, very obtuse, trigonous, 10½ by 6 in. diam., with one or two smaller nearly globose ones beneath, carpels very distinct, free portions ½–¾ in. high, crowns rounded or rather flat, obtusely angled, quite smooth, stigmas 2–3, very slightly prominent, hard, brown.' The large, distant, strongly hooked marginal spines of the leaf do not appear to me at all to resemble those of the figures of Rheede referred to by Dr. Trimen, but agree with those of Rheede's Kaida Toddi, ii. t. 6.—J. D. H.

2. **FREYCINETIA,** *Gaudich.*

Slender shrubs, climbing by aerial roots; l. tufted at the ends of the branches, tristichous, elongate, base sheathing; fl. diœcious, crowded on simple, terminal, fascicled or sub-umbellate spadices, surrounded by white or coloured spathes; perianth 0; male fl.:—stam. crowded on an elongated rhachis, fil. long or short, anth. linear-oblong, apiculate or cuspidate, pistillodes small or 0; fem. fl. staminodes short, hypogynous, linear, adnate to the base of the ov., carpels free or connate in bundles, 1-celled, top thickened, crowned with a depressed annular crenulate stigma, ovules many, attached by long ascending funicles to 3 or more parietal placentas; fr. a fleshy syncarp of confluent carpels crowned with hardened stigmas, cells many-seeded, full of mucilage; seeds oblong or fusiform. —Sp. about 38; 5 in *Fl. B. Ind.*

Fil. of stam. elongate . . . . 1. F. PYCNOPHYLLA.
Fil. of stam. very short . . . . 2. F. WALKERI.

1. **F. pycnophylla,** *Solms in Linnæa*, xlii. 91 (1878).

F. angustifolia, Thw. Enum. 327 (non Bl.). *Pandanus scandens*, Moon, Cat. 67. C. P. 366.

Fl. B. Ind. vi. 487.

Stem as thick as a goose-quill, internodes short; branches spreading, strict or recurved; l. 5–7 by $\frac{1}{6}$–$\frac{1}{3}$ in., narrowed from the base to the acuminate tip, margins closely minutely spinulose, dark green above, striated, paler beneath; infl. short, floral l. broadly ovate, caudately acuminate, lower 1–1½ in. broad, green, inner yellow, with green tips; spadices of both sexes 3–6, subumbellate, about $\frac{2}{3}$ in. long, $\frac{1}{3}$ in. diam., cylindric, pedicels $\frac{1}{3}$–$\frac{2}{3}$ in., stout; male spadix yellow, covered with crowded stam. and minute pistillodes, fil. long, anth. ovate, acute; fem. spadix covered with clavate, compressed, obtuse carpels; syncarp 1 by $\frac{2}{3}$ in., scarlet, carpels crowned with sessile disciform stigmas.

Climbing on large trees, in moist low country; very common. Fl. Nov.–April; male spadix pale yellow, ripe fem. scarlet.
Endemic.

2. **F. Walkeri,** *Solms in Linnæa*, xlii. 92 (1878).
P. radicans, Thw. Enum. 327 (non Gaud.). C. P. 2333.
Fl. B. Ind. vi. 487.

Stem as thick as the little finger or thicker; l. 12–18 by $\frac{3}{4}$ in., linear, finely acuminate, margins spinulose, spinules spreading, bright greeen, paler beneath, sheath 1–3 in., green or brownish; floral l. 3–5 in., oblong or ovate-lanceolate, acuminate, scarlet with green tips; spadices peduncled, ped. 1½–2 in.; male about 1 in. long by $\frac{1}{3}$ in. diam., cylindric, pale yellow, covered with crowded stam., fil. very short, anth. oblong, pistillodes minute, sessile, 2-lobed; fem. spadix longer than the male, 3 in. long by 1 diam., cylindric-oblong; ov. fusiform, stigma 2-lobed, ripe scarlet.

Climbing over large trees, in moist region up to 4000 ft.; common. Fl. March.
Also in Andaman Is. (?).

CXLI.—TYPHACEÆ.

TALL, marsh, perennial herbs; rootstock stout; l. linear, erect; fl. minute, unisexual, crowded in cylindric, catkin-like, unisexual spikes, mixed with capillary, straight, articulate hairs of extreme tenuity, some of which (bracts?) have clavellate tips; male fl.:—perianth 0 (or of hairs?), stam. solitary or clustered, fil. free or connate, anth. basifixed, 2-celled, dehiscence lateral; fem. fl. consisting of a capillary filament swollen into a narrow ov. above the middle, terminated by a capillary style with a slightly swollen linear

stigma, 1-celled, ovule pendulous from the top of the cell; fr. minute, embryo cylindric in floury endosperm, radicular end thickened, plumule in a lateral slit.

TYPHA, *Linn.*

For characters, see Order.—Species, reputed, about 10; 4 in *Fl. B. Ind.*

T. javanica, *Schnitzl. in Zoll. Verz. Ind. Arch. Pfl.* 77 (1854). **Hambu-pan,** *S.*

T. latifolia, Moon, Cat. 61 (non L). *T. angustifolia*, Thw. Enum. 331 (non L.). C. P. 3218.

Fl. B. Ind. vi. 489. Kerner in Bot. and Zool. Ges. Wien. xxxix. t. v. f. 6.

Rootstock horizontal; stem 4–6 ft., composed of l. sheaths, as thick as the wrist at the base, terete, smooth; l. as long as the stem, erect, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, biconvex above the sheath, quite smooth, spongy within, sheaths terete, of lower 3–6 in.; male spike 4–6 by $\frac{1}{2}$ in., bracts 0; hairs simple, toothed or forked; bracteoles shorter than the stam.; anth. linear, tip umbonate, pollen simple; fem. spike $\frac{1}{2}$–1 in. below the male, 5–6 in. by $\frac{1}{3}$–$\frac{2}{3}$ in. diam.; fem. fl. mixed with pistillodes and hairs with subspathulate tips, ov. fusiform, stigmas linear.

Ponds in the low country, chiefly in the dry region; rare. Colombo; near Galle; Tissamaharama, abundant; Batticaloa; Anuradhapura. Fl. August.

Also in Malay Islands and Mauritius.

Trimen in a note says, 'how different from *T. angustifolia*, L.' (?) (a common European plant). The two species are extremely similar, but the stigmas are described as dilated in *T. angustifolia.*—J. D. H.

CXLII.—ARACEÆ.

HERBS, with a tuberous or creeping rootstock and radical l., or suffruticose climbers with aerial roots; l. entire or divided, petiole sheathing; infl. a spathe, enclosing a fl. bearing uni- or bisexual spadix, which often terminates in a long or short naked appendage; fl. small or minute, uni- rarely bisexual, crowded in unisexual clusters on the spadix, male clusters above the fem. in the bisexual spadices, with or without interposed neuters, and with sometimes neuters above the males; perianth 0, or of scales; male fl.:—anth. 2–4-celled, very various, free or connate; fem. fl.:—ov. sessile, 1–3-celled, cells 1- or more ovuled, style and stigma various, ovules erect

or pendulous, orthotropous, amphitropous, or half anatropous; fr. a 1- or few-seeded berry; embryo small in copious endosperm, or macropodous without endosperm.

Fl. unisexual.	
Anth.-cells broader than the connective.	
Ovules orthotropous. Herbs leafing and flg. simultaneously (*Arineæ*).	
Ovary solitary. A stemless floating herb	1. PISTIA.
Ovaries many whorled.	
Ovaries in one whorl at the base of the spadix	2. CRYPTOCORYNE.
Ovaries in several whorls or spirally arranged.	
Aquatic or marsh herbs . . .	3. LAGENANDRA.
Terrestrial herbs.	
L. compound	4. ARISÆMA.
L. simple or lobed.	
Ovules 1–2, basal . . .	5. TYPHONIUM.
Ovules many, basal and apical .	6. THERIOPHONUM.
Ovules anatropous. Herbs flg. before leafing; l. compound. (*Pythonieæ.*)	
Spadix without neuter fl.	7. AMORPHOPHALLUS.
Spadix with neuter fl. below the males .	8. SYNANTHERIAS.
Anth. cells much narrower than the fleshy, prismatic, truncate connective. (*Colocasieæ.*)	
Limb of spathe refracted	9. REMUSATIA.
Limb of spathe erect.	
Ovules many, parietal	10. COLOCASIA.
Ovules few, basal	11 ALOCASIA.
Fl. bisexual.	
Perianth 0, climbing shrubs. (*Calleæ.*) . .	12. RAPHIDOPHORA.
Perianth of 4–6 scales. (*Orontieæ.*)	
Climbing shrubs with distichous l. . .	13. POTHOS.
Erect herbs.	
Prickly herbs, with long twisted spathe .	14. LASIA.
Smooth herbs, with ensiform l. . .	15. ACORUS.

1. **PISTIA,*** *L.*

A floating, stemless, gregarious, monœcious herb with tufted root-fibres; l. sessile in a close spiral, obovate-cuneate, together forming a cup, veins parallel, stipulary sheaths small, membranous; spathe small, shortly peduncled, tube short, limb ovate, concave, spreading; spadix adnate to the back of the tube of the spathe, free above; male infl.:—a whorl of 2–8 connate anth. near the top of the spadix, with a whorl of minute neuters below it, anth.-slits vertical; fem. infl.:—a solitary, oblong, 1-celled ov., obliquely adnate to the spadix

* Name from πιστός, a drinker.

for nearly its whole length, tip free, incurved, forming a conical style with an obtuse stigma, ovules many, crowded on a parietal placenta, orthotropous; fr. ovoid, pericarp thin, bursting irregularly; seeds many, sessile, oblong- or obovoid, testa at length rugose, embryo minute, in copious endosperm. —Monotypic.

P. Stratiotes, *L. Sp. Pl.* 963 (1753). **Drya-parandella,** *S.*
Herm. Mus. 68. Burm. Thes. 222. Fl. Zeyl. n. 322. Moon, Cat. 49. Thw. Enum. 331. C. P. 3334.
Fl. B. Ind. vi. 497. Roxb. Cor. Pl. t. 269. Bot. Mag. t. 4564.

Root-fibres clothed with fibrillæ; l. 1¼–4 in., tip rounded or retuse, variable in breadth, puberulous on both surfaces, veins few or many, strong beneath, flabellately disposed, converging within the margin; spathe about ½ in. long, obliquely campanulate, white, gibbous and closed below, contracted in the middle, limb nearly orbicular.

Low country; common in clear still water.
Throughout the Tropics.
Known to the English as the 'Water-lettuce.' Occasionally found in quite brackish or even salt water on the coast.

2. CRYPTOCORYNE, *Fisch.*

Usually aquatic or marsh stemless herbs; rootstock tuberous or slender, sometimes creeping, often soboliferous; l. radical, sessile or petioled, broad or narrow, penniveined, veins spreading or nearly parallel, stipular sheaths small, leaf-opposed, subulate or filiform; spathe sessile or peduncled, closed below with a transverse septum below the mouth, limb short or long, open or twisted; spadix very slender, naked between the inflorescences, tip adnate by a short appendage to the septum; male fl. at the top of the spadix, anth. few or many, sessile, 2-celled, connective narrow, cells truncate or with a conical perforated tip; ov. in a single whorl round the base of the spadix with sometimes a few neuters intermixed, connate, 1-celled, style short, recurved or 0, stigmas oblong, ovules many, erect, orthotropous; fr. a coriaceous syncarp of connate 2-valved, few- or many-seeded carpels; seeds oblong, embryo in the axis of copious endosperm.—Sp. 26; 16 in *Fl. B. Ind.*

Tube of spathe shorter than the limb.
  Stigmas oval or oblong.
    L. linear-lanceolate . . . . 1. C. SPIRALIS.
    L. broadly oblong or obovate . . . . . 2. C. THWAITESII.
  Stigmas globose . . . . 3. C. NEVILLII.

Tube of spathe narrow, longer than the limb.
Base of l. cuneate or rounded . . . . . 4. C. WALKERI.
Base of l. cordate . . . . 5. C. BECKETTII.

1. **C. spiralis,** *Fisch. in Linnæa*, v. 428 (1830).
Fl. B. Ind. vi. 494. Wight, Ic. t. 773. Bot. Mag. t. 2220 (*Arum spirale*).

Rootstock tuberous, soboliferous, roots vermiform; l. 3–8 by $\frac{1}{3}$–$\frac{2}{3}$ in., linear-lanceolate, acuminate or acute, narrowed from the middle to both ends, nearly parallel-veined, base narrowed into a short stout petiole; spathe subsessile, 3–5 in. long, tube very short, obconic, limb linear-lanceolate, at first twisted, greenish externally, within dark purple, and transversely lamellate; ov. 5–6, stigma broadly oval.

Ceylon, Kœnig in Herb. Mus. Brit.
Also in Peninsular India and Bengal.

2. **C. Thwaitesii,** *Schott in Bonplandia*, v. 221 (1857).
Thw. Enum. 334. C. P. 3464.
Fl. B. Ind. vi. 495. Engler, Ic. Arac. ined. t. 7.

Rootstock stout, with very long stout and slender root-fibres; l. 2–3 by 1–1$\frac{1}{2}$ in., very shortly petioled, broadly oblong or obovate, tip rounded, base rounded, emarginate or cordate, crenulate, rather fleshy, pustular on the upper surface, veins 4–5 pairs from below the middle of the broad costa, diverging, then converging near the tip, transverse venules distant, strong, petiole shorter than the blade, very stout, stipular sheaths subulate; spathes 2–3 in., subsessile, tube cylindric, swollen at the base, about $\frac{1}{3}$ shorter than the linear hardly twisted limb, which is smooth and spotted with red-purple within; anth. 4–6, oblong; ov. 6, styles rather long, stigmas oblong.

Wet places in forests in moist low country; very rare. Singhe Raja Forest; Hewesse; Kottawa Forest near Galle. Fl. April, May; whole plant of a dirty violet-purple colour.

Endemic.

A coloured drawing of this plant in Herb. Peraden. represents it as wholly of a dingy violet-purple colour. Dr. Scott has kindly had the pustules on the upper leaf-surface examined for me by Mr. Boodle, at the Joddrel Laboratory, Kew, and informs me that they are hollow elevations of the epidermis and subjacent layer, sometimes crowned by a stoma, the hollow space being an exaggeration of the usual air chamber beneath a stoma; also that the cuticle of the leaf is beautifully striated, as frequently occurs in plants from a damp habitat.—J. D. H.

3. **C. Nevillii,** *Trimen Ms. in Herb. Peraden.* (1885) (name only).

Rootstock stout, cylindric, with long cylindric fleshy root-fibres; l. long-petioled, 1–3 by $\frac{1}{4}$–$\frac{3}{4}$ in., linear, or obovate-oblong, obtuse, quite entire, membranous, midrib broad, veins

very slender, base narrowed into a petiole margined below with a hyaline narrow sheath; spathe peduncled, with the tip alone protruded above the ground, 2–3 in. long, tube narrow, cylindric, about ½ in. long, edged and spotted with dark purple, limb longer than the tube, linear-lanceolate, acuminate, greenish-purple; spadix very slender, anth. crowded in a short cylindric column, crowned by the small conic appendage; ov. in a whorl of 6–7 (?), with large globose stigmas, surrounding an inner whorl of minute imperfect (?) ones, with globose stigmas.

Wet places in dry region; very rare. Near Grukamana Tank and near Wawinna amongst grass. E. Prov., 1885 (Nevill). Fl. Nov.

The specimens are quite insufficient for a satisfactory description. In a note accompanying them Dr. Trimen writes: 'Near Hinguima and Ekgalara, a mile from Yakkiniganna Hela, a few miles W. of Grukamana Tank, and near Wawinna; also in marshy soil. "Wagapul" native name. Only tip of spathe protruded above ground.—Nov. 1885, H. Nevill.'

If I am correct in describing the ovaries as in two whorls, the inner of imperfect carpels, the plant is intermediate between *Cryptocoryne* and *Lagenandra.* I failed to detect the structure of the anth. in the only specimen examined.—J. D. H.

4. **C. Walkeri,** *Schott in Bonplandia*, v. 221 (1857).
C. spiralis, Thw. Enum. 334 (non. Fisch.).
Fl. B. Ind. vi. 492.

L. 2–4 in., oblong or oblong-lanceolate acute, membranous, faintly crenulate, base cuneate or rounded, veins about 4 pairs from below the middle of the costa, petiole 6 in., very slender; spathe very shortly peduncled, 3 in. long, tube 2 in., narrow, limb shorter than the tube, linear-lanceolate, acuminate, strongly twisted, glabrous, smooth; spadix very slender; ov. 4–5, styles subincurved, stigmas small, globose; syncarp small, spherical; seeds oblong, narrowed upwards from a conical base, obtuse, angled, angles remotely warted.

Ceylon, Walker in Herb. Kew.

Only known by specimens from Walker in Herb. Kew.

5. **C. Beckettii,** *Thw. ex Trim. in Journ. Bot.* xxiii. 269 (1885).
C. P. 3868.
Fl. B. Ind. vi. 493.

Rootstock slender, simple and branched, elongate, pale; l. 2½–4 by 1–1¼ in., oblong, linear-oblong, or oblong-lanceolate, obtuse or subacute, quite entire, membranous, base more or less cordate, veins 3–5 pairs from below the middle of the broad costa, petiole 4–8 in.; spathe sessile, ¾ in. long, tube narrow, about twice as long as the small caudate blade.

Dry and intermediate region, in chinks of rocks; rare. Matale East (Beckett); near Nilgala, Uva. Fl. Jan., Feb.

Endemic.

The specimens in Herb. Peraden. do not suffice for a better description. One marked *C. Beckettii* (?) from chinks of dry rocks, Kahata-ata, Hela, near Nilgula (Thwaites) has smaller crenulate l., with white shining sheaths.—J. D. H.

3. LAGENANDRA, *Dalzell.*

Aquatic herbs with the characters of *Cryptocoryne*, but with many ovaries in close cycles at the base of the spadix.—Sp. 5; all in *Fl. B. Ind.*

Spathe narrow.
  L. 2–6 in. long.
    Spathe smooth, tube ovoid-oblong . . . 1. L. THWAITESII.
    Spathe warted, tube obconic . . . . . 2. L. LANCIFOLIA.
  L. 1–3 ft. long.
    L. ovoid-oblong . . . . 3. L. TOXICARIA.
    L. loriform . . . . 4. L. KŒNIGII.
Spathe broad . . . . 5. L. INSIGNIS.

1. **L. Thwaitesii**, Engler, Monog. Arac. 621 (1879). C. P. 3173.
Fl. B. Ind. vi. 496.

Rootstock stout, branching, with vermiform root-fibres; l. 4–6 by $\frac{3}{4}$–2 in., linear to ovate- or oblong-lanceolate, acute or acuminate, quite entire, coriaceous, opaque and very dark green when dry, base acute or rounded, veins very many, diverging from the broad midrib, petiole stout, longer or shorter than the blade, stipular sheaths narrow, obtuse; spathe short, shortly peduncled, 1$\frac{1}{2}$–2 in. long, dull green and purplish without, smooth, dark purple within, tube $\frac{1}{2}$ in., ovoid-oblong, shorter than the ventricose limb; spadix with a short cylindric group of anth., surmounted by an ampulliform appendage; ov. many, in irregular cycles, globose, connate at the very base; syncarp $\frac{2}{3}$ in. diam., carpels globose, beaked.

Wet places in low moist country; rare. Kalutara, Singhe Raja Forest, Hewesse. First collected by Gardner. Fl. Jan.–April.
Endemic.

The leaves, when fresh, are beautifully crisped and mottled with white at the margins.

2. **L. lancifolia**, *Thw. Enum.* 334 (1864). ***Ati-udayan,** *S.*
Arum minutum, Moon, Cat. 64 (non Willd.). C. P. 3174.
Fl. B. Ind. vi. 496.

Rootstock stout, branching, with long vermiform root-fibres; l. 2–4 by $\frac{3}{4}$–2 in., lanceolate or ovate-lanceolate, acute, closely minutely dotted with white beneath, sparsely above, dark brown and opaque when dry, base rounded or acute, veins very many, diverging from the stout midrib, petiole as long as the blade or longer, stipular sheaths very narrow,

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* Name applied to more than one plant.

obtuse, spathes very shortly peduncled, 1–2 in., dark purple, densely warted in longitudinal streaks, tube obconic, half as long as the limb, which is ventricose at the base; ov. in 5–6 cycles, connate at the very base, stigma conical.

Banks of streams and rivers in moist low country; common. Fl. Feb. Endemic.

Leaves often a uniform red-purple.—*Trimen.* In Ic. Herb. Peraden. some are represented as light-red-brown beneath; others as green on both surfaces.—J. D. H.

3. **L. toxicaria,** *Dalzell in Hook. Journ. Bot.* iv. 289 (1852). **Vétala,** *S.*

Caladium ovatum, Vent., Moon, Cat. 64. *L. ovata*, Thw. Enum. 334, C. P. 3315.

Fl. B. Ind. vi. 495. Rheede, Hort. Mal. xi. t. 23.

Rootstock as thick as the wrist, creeping, simple, annulate, root-fibres vermiform; l. 12–18 by 3–5 in., oblong or oval-oblong, obtuse or acute, coriaceous, base acute or rounded, margins undulate, quite entire, veins very many, slender, diverging from the stout costa, petiole as long as the blade, semi-cylindric, as stout as the little finger, stipular sheaths acuminate, 2-keeled; peduncle much shorter and more slender than the petiole, compressed; spathe 3–6 in., dull green streaked with purple externally, dark purple within, tube broadly ovoid, limb ovate-lanceolate, $1-1\frac{1}{2}$ in. broad, caudate-acuminate, slightly twisted, tail 2–3 in. long; male infl. cylindric, anth. crowded, yellow, cells with tubular tips, appendage short, conical, purple; ov. in many cycles, crowded in a globose head, obconic or subglobose, angled, stigma sessile, pulvinate, 5-angled, ovules 4–8 on a basal placenta; syncarp on a very stout decurved peduncle, globose, $1\frac{1}{2}-2$ in. diam., carpels about $\frac{1}{3}$ in. long, free, partially dehiscent, crown green, rounded; seeds $\frac{4}{10}$ in. long, narrowly oblong, terete, furrowed.

In shallow water in the moist low country; very common. Fl. Feb. Also in S. India.

Rootstock reputed poisonous in Peninsular India.

4. **L. Kœnigii,** *Thw. Enum.* 334 (1864).

Cryptocoryne Kœnigii, Schott, Prod. Aroid. 16. C. P. 3496.

Fl. B. Ind. vi. 496. Engler, Ic. ined. Arac. t. 15.

Rootstock columnar, 1 ft. long, $1\frac{1}{2}$ in. diam., annulately scarred, with very stout vermiform roots at the base; l. crowded, subsessile on the top of the rootstock, 1–2 ft. by $\frac{1}{4}-\frac{3}{4}$ in., loriform or very narrowly linear-lanceolate, acuminate, thickly coriaceous, dark brown when dry, clouded with white beneath, base narrowed into a short, stout petiole, which is concave above and trigonous at the base, veins nearly parallel

with the stout midrib below, diverging upwards; peduncle 2–3 in. long, slender, thickening in fr.; spathe 3–5 in. long, pale green without, dark purple within, tube obconic, much shorter than the smooth subulate limb; male infl. cylindric, anth. densely crowded, appendage clavate; ov. in many cycles, forming a short green column, connate below, 1-ovuled, stigma disciform; syncarp pendulous from the long, stout, decurved ped., globose, about 1 in. diam., carpels ½ in. long, crown rounded; seeds ½ in. long, linear-oblong, dark brown, deeply grooved.

Wet places in moist low country; rather rare. Singhe Raja Forest; Galpana; Palewatu, Pasdun Korale; Morotuwa. Fl. Jan.–April.

Endemic.

5. **L. insignis,** *Trim. in Journ. Bot.* xxiii. 269 (1885).
Fl. B. Ind. vi. 496.

Rootstock columnar, 1½ in. diam., closely annulately scarred, roots very stout, vermiform; l. long-petioled, 6–12 by 3–4 in., oblong- or ovate-lanceolate, acute or acuminate, rather membranous, margins quite entire, closely minutely dotted beneath, base acute, veins very many and slender, divergent from the very stout midrib, scurfily papillose beneath, petiole very stout, shorter than the blade, concave above; peduncle stout; spathe 6–8 in. long, closely ribbed externally, tube 1½–2 in. long, funnel-shaped, limb 6–9 by 2–3 in. broad, strongly recurved, oblong, truncate, abruptly caudate, strongly ribbed, streaked with white and purple externally, within dark purple, crisped transversely undulate and lacunose, tail 1–1½ in., slender; male infl. cylindric, densely crowded; ov. in about 6 cycles, forming a globose head.

By streams; very rare. As yet only found in Palewatu Forest, Pasdun Korale. Fl. March–May.

Endemic.

The spathes stain paper of a purple colour. Spathe purple, with white veins and infl. and fl. as in *L. toxicaria.*

4. **ARISÆMA,** *Mart.*

Tuberous, monœcious or diœcious herbs, stem rooting from above the tuber; l. one or few, long-petioled, compound, leaflets whorled, penniveined, veins meeting in an intra-marginal one; spathe solitary, peduncled, deciduous in fr.; tube convolute, cylindric, limb various; spadix included in the spathe or exserted, terminated by a cylindric clavate or caudiform appendage; male infl. of many stipitate or sessile 2-celled anth., with short vertical slits; fem. infl. of many

1-celled ov. at the base of the spadix, style short or 0, stigma disciform, ovules 2 or more, basilar, orthotropous; neuter fl. 0 or few, variously disposed, subulate; fr. a 1–few-seeded berry; embryo in copious endosperm.—Sp. about 50; 38 in *Fl. B. Ind.*

Appendage of spadix slender, exserted.
  Spathe acuminate, tip decurved . . . 1. A. NEGLECTUM.
  Spathe abruptly caudate . . . . . 2. A. FILICAUDATUM.
Appendage of spadix cylindric, obtuse . . 3. A. LESCHENAULTII.

1. **A. neglectum,** *Schott in Bonplandia*, v. 26 (1859). **Walkidaran,** *S.*

Arum pentaphyllum, Moon, Cat. 64 (? Linn.). *A. filiforme*, Thw. Enum. 335 (non Bl.). *A. curvatum*, Thw. l. c. (non Kunth). *A. Wightii*, Hk. f. in Bot. Mag. t. 5507 (non Schott). C. P. 3118.

Fl. B. Ind. vi. 504. Bot. Mag. t. 5507 (from Ceylon specimens).

Monœcious; tuber globose, 1½ in. diameter; stem 1–2 ft. slender, clothed wlth long mottled sheaths; l. 1 or 2, pedately 5–7-foliolate, leaflets sessile or shortly petiolulate, oval or oblanceolate, cuspidately or caudately acuminate, base acuminate, bright green, many veined, petiole 3–10 in., terete, green; spathe 3–4 in., green, tube 1½ in., cylindric, striate, green and white or purplish, base swollen, limb about as long, oblong, cymbiform, obtusely acuminate, arched and tip incurved, margins of mouth not or scarcely recurved; spadix rather stout, much larger than the spathe, appendage up to 8 in. long, sessile on the male infl., caudiform, very slender, pale yellow-green, suddenly bent forward and then upwards and erect, or decurved and pendulous; anth. scattered, stipitate, solitary or binate, occupying two-thirds of the spadix below the appendage; ov. occupying the other third, ovoid-oblong, green, stigma sessile, discoid.

Moist region up to 4000 ft.; rather common. Fl. April, Sep.
Also in S.W. India.

2. **A. filicaudatum,** *N. E. Br. in Journ. Linn. Soc.* xviii. 253 (1880). C. P. 3980.

Fl. B. Ind. vi. 507.

Diœcious; l. solitary, long-petioled, 6–7-foliolate, leaflets whorled, sessile or subsessile, 5–9 by 1½–2½ in., lanceolate, oblanceolate, or oblong-lanceolate, cuspidately acuminate, membranous, tip capillary, base cuneate, petiole 1 ft. or more; ped. stout, as long as the petiole; spathe 2½ in., tube cylindric, 1½ in., limb 3 in. long, broadly ovate, incurved, abruptly contracted into a filiform tail 6–10 in. long, with subclavate tip, base narrowed; male spadix 1½ in., slender, basal third covered with 4-nate subsessile anth.; appendage 1½ in., columnar,

slightly constricted about the middle, base hardly thickened, tip clavate, smooth; fem. spadix 2 in. long, infl. conical, $\frac{2}{3}$ in. long, ov. globose, stigmas pulvinate; appendage $\frac{1}{2}$ in. long, erect, cylindric.

Moist region; very rare. I have seen only the C. P. specimens, collected in Morowak Korale at about 3000 ft., in July, 1865, by Thwaites.
Endemic.

3. **A. Leschenaultii,** *Blume, Rumphia*, i. 93 (1835). **Wal-Kidaran,** *S.*
A. papillosum, Steud., Thw. Enum. 335. C. P. 546.
Fl. B. Ind. vi. 504. Bot. Mag. t. 5496 (from Ceylon specimens).

Monœcious or diœcious; tuber globose, 2 in. diam.; stem 6 in., stout, clothed with long mottled sheaths; l. pedatipartite, leaflets 5–11, whorled, subsessile, lanceolate, caudate-acuminate, dark green above with a stout midrib, pale beneath, base acuminate; petiole stout, 1–2 ft. long, pale green irregularly barred or mottled with pale purple; spathe emerging from the sheath of the petiole, very shortly peduncled, 6–18 in. long, dark green, externally striped with pale green or dull purple, very dark green within, tube as long as the limb, narrow, ribbed, erect, gradually dilated into the slightly decurved, ovate-lanceolate, acuminate, cymbiform limb which terminates in a filiform clavellate tip sometimes 3 in. long; spadix up to 3 in. long, gradually passing into a very narrowly clavate, pale green, smooth appendage longer than the infl. with a rounded sometimes verruculose top; anth. 3–4-nate, sessile, with a few subulate neuters above them; ov. very many, minute, densely crowded.

Montane region, in shady places; common. Fl. Sept., &c.; colour of spathe very variable.
Also in Western India.

5. TYPHONIUM, *Schott.*

Tuberous, monœcious herbs, stem 0; l. few, petioled, entire, 3–5-lobed or -partite, penniveined; spathe peduncled, constricted above the short convolute persistent tube, limb refracted, broad, deciduous; spadix included, or male infl. and appendage exserted, male and fem. infl. distant, with neuters above the fem. and sometimes below the male, appendage elongate, smooth; anth. subsessile, didymous; ov. 1-celled, stigma sessile, pulvinate, ovules 1–2, basal, erect, orthotropous; berries ovoid, 1–2-seeded; seeds globose, embryo axile in copious endosperm.—Sp. about 17; 10 in *Fl. B. Ind.*

Interspace between the male and fem. infl. naked.
Neuters long, filiform, tortuous . . . . . 1. T. TRILOBATUM.
Neuters short, subulate, decurved . . . . 2. T. ROXBURGHII.
Interspace between the male and fem. infl. covered with neuters . . . . 3. T. CUSPIDATUM.

1. **T. trilobatum,** *Schott in Wien. Zeitschr.* 72 (1829). **Panu-ala,** *S.*

Herm. Parad. Bot. 78; Mus. 33. Burm. Thes. 89. Fl. Zeyl. n. 326. *Arum trilobatum,* L. Sp. Pl 965; Moon, Cat. 64; Thw. Enum. 334. C. P. 2896.

Fl. B. Ind. vi. 509. Herm. Par. Bat. t. 78. Wight, Ic. t. 801 (*Arum orixense*).

Tuber subglobose, about 1 in. diam.; l. long-petioled, hastately 3-lobed with a truncate or cordate or 2-lobed base, the lobes broad or narrow, sinus sometimes very deep and narrow, or 3-partite, with segments 5–7 in. long, the central broadly ovate, acuminate, lateral smaller, dolabriform; petiole 6–12 in.; spathe 3–8 in., ped. 1–4 in., tube oblong or pyriform, much shorter than the broadly ovate, caudate-acuminate, expanded limb, which is dull red-purple within, paler externally, with undefined green stripes; spadix 2–4 in., sessile, erect, male infl. cylindric, fem. very short, surmounted by a dense mass of filiform tortuous neuters, ½ in. long, interspace between the neuters and male infl. naked; appendage shortly stipitate, slender, striate, acute or obtuse, red, base truncate; anth. minute; ov. crowded in a hemispheric mass, stigma pulvinate.

Damp places in moist low country; common. Fl. July, August.
Also in India, Burma, Malaya.
Often a troublesome weed in cultivated ground.

2. **T. Roxburghii,** *Schott, Aroid.* i. 12, t. 17 (1855). **Polon-ala,** *S.*

Arum divaricatum, Moon, Cat. 64 (? L.). *Arum Roxburghii,* Thw. Enum. 432. C. P. 3764.

Fl. B. Ind. vi. 510. Wight, Ic. t. 803 (*A. trilobatum*). Bot. Mag. t. 339 (*A. trilobatum;* from Ceylon specimens).

Tuber 1 in. or more diam.; l. 2–5 in., hastate or deltoid-cordate, as broad as long or broader, or 3-lobed with rounded basal lobes and open sinus, or 3-partite with dimidiate-ovate or oblong side-lobes and ovate-acuminate mid-lobe; petiole as long as the blade or longer; spathe 3–8 in., tube ½–¾ in., ovoid or ellipsoid, limb deflexed, broadly ovate-lanceolate, explanate, narrowed into a long twisted tip that rests on the ground, smooth, dark vinous purple within, paler and more dingy purple externally; spadix 5–7 in., sessile, erect, male infl. exserted, ⅙ in. long, cylindric, fem. very short, surmounted by neuters, interspace between the males and neuters slender,

naked; appendage very long, stipitate, cylindric or narrowed from the truncate base to the tip, dark purple; anth. minute; ov. densely crowded, stigmas pulvinate; neuters crowded in a short cylindric column, subulate, recurved, yellow.

Low country in moist region; apparently rare. About Colombo (Ferguson); weed in Peradeniya Gardens. Fl. March–August, December.

Also at Singapore.

Engler considers this as a variety only of *T. divaricatum*, Dcne. I suspect *Arum divaricatum*, L., to be either this or *T. cuspidatum* (and not *T. divaricatum*, Dcne.). It is Fl. Zeyl. n. 325, but unfortunately there are no specimens in Hermann's Herb. Linnæus also quotes Rheede, Hort. Mal. xi. t. 20, which Engler refers to *T. cuspidatum.*—*Trimen.*

T. divaricatum, Dcne. I suspect confusion here. This widely distributed species is given for Ceylon in Fl. B. Ind. vi. 510, but the localities quoted are those above given for *T. Roxburghii.* I have seen no specimens. Figured in Wight, Ic. t. 790.—*Trimen.*

3. **T. cuspidatum,** *Dcne. in Nouv. Ann. Mus. Par.* iii. 367 (1834). Trim. in Journ. Bot. xxvii. 167.

Fl. B. Ind. vi. 511 (not given for Ceylon). Blume, Rumphia i. t. 30. Wight Ic. t. 791.

Tuber about 1 in. diam.; l. long-petioled, 2–5 in. long, hastately oblong-lanceolate, acuminate, basal lobes short subacute, sinus narrow or open, petiole 4–10 in.; spathe 4–5 in., peduncled, green, tube ½–1 in., ribbed, limb three times as long as the tube, very narrowly linear-lanceolate, narrowed to the decurved or pendulous tip; spadix shortly stipitate, slender, male infl. ¼ in., cylindric, fem. shortly cylindric, interspace covered with clavate, purple-headed neuters below the male infl. and subulate white ones above it; anth. minute, yellow; ov. clavate, green; appendage stipitate, as long as the spathe, slender, acuminate.

Moist low country; apparently very rare, but probably overlooked. Round Colombo Lake, 1886 (Ferguson). Fl. July.

Also in Bengal, Burma, and Malaya.

6. **THERIOPHONUM,** *Bl.*

Tuberous, monœcious herbs; stem 0; l. few, petioled; spathe constricted above the short convolute persistent tube, limb deciduous; spadix included, slender, male and fem. infl. distant, male with subulate neuters above it, and long narrow clavate ones immediately below it, fem. of few ov. at the base of the spadix, interspace beween the fem. infl. and lower neuters naked; anth. sessile, globose; ov. sessile, 1-celled, stigmas pulvinate, ovules many, pendulous from the top of the cell, orthotropous; berries ovoid or oblong.—Sp. 5; all in *Fl. B. Ind.*

1. **T. crenatum,** *Blume, Rumph.* i. 128 (1835).

T. zeylanicum and *crenatum* N. E. Br. in Journ. Linn. Soc. xviii. 258, 259 (1880). *Arum divaricatum*, Thw. Enum. 334 (non L.). *A. crenatum*, Wight in Hook. Bot. Misc. ii. 100.

Fl. B. Ind. vi. 512. Hook. Bot. Misc. l. c. Suppl. t. 3 (*A. crenatum*).

Tuber ½–1 in. diam., subglobose; l. 3–8 in. long, hastately 3-lobed, very variable in breadth, from narrowly linear to deltoidly ovate, acute or acuminate, basal lobes ovate or lanceolate, spreading, acute or rounded, sinus broad or narrow, young l. oblong, deeply cordate, tip rounded, petiole 4–10 in.; spathe shortly peduncled, 2½–3½ in., erect, green, tube globose, ½ in. diam., streaked with purple, limb oblong-lanceolate, acute, concave, margins crenately undulate, purple; spadix sessile, shorter than the spathe, erect; male infl. about ½ in. long, cylindric, anth. globose, beaked, purple; fem. of one whorl of very slender globose ov.; upper neuters very short, lower slender, ⅛ in., falcate, spreading; appendage cylindric, obtuse, narrowed at the base; fr. on a stout decurved ped., of a whorl of 6 or 8 oblong carpels with broad disciform stigmas.

Grassy places in the dry country; rather common. Trincomalie (Glenie); Puttalam (Pole); Anuradhapura; Wellasce. Fl. Dec., Jan. Endemic.

The leaves are much more deeply lobed in the Ceylon than in the Peninsula specimens.

7. AMORPHOPHALLUS, *Bl.*

Tuberous herbs, flowering before leafing, or together; l. tripartite, segments pinnatisect, veins pinnate, meeting in an intramarginal one; spathe campanulate, marcescent, tube short, convolute, limb broadly expanded, margins undulate; spadix very stout, appendage large; infl. cylindric, male and fem. contiguous, neuter organs 0; anth. densely crowded in groups of 2–4, sessile, cells oblong, pores apical; ov. 1–4-celled, style long, stigma capitate, lobed, ovules solitary on each cell, subbasilar, anatropous; berry subglobose or obovoid; seeds large, endosperm 0, embryo macropodous.—Sp. about 40; 14 in *Fl. B. Ind.*

Tubers leafing after flg. . . . . . . 1. A. CAMPANULATUS.
Tubers leafing and flg. contemporaneously . 2. A. DUBIUS.

1. **A. campanulatus,** *Bl. ex Dcne. in Ann. Mus. Par.* iii. 366 (1834). **Kidaran,** *S.*

Herm. Par. Batav. 89; Mus. 21, 33. Burm. Thes. 89, 90. Fl. Zeyl. n. 422 (*Dracunculus*). *Dracontium polyphyllum*, Willd., Moon, Cat. 30. Thw. Enum. 335. C. P. 2823.

Fl. B. Ind. vi. 513 and 514 (*A. Rex*), Wight, Ic. tt. 782, 785.

Tuber depresssed-globose, 8–10 in. diam., bulbilliferous, dark brown; l. 1 or 2, appearing after flowering, 1–3 ft. broad, segments spreading, simple or forked, leaflets 2–5 in., sessile, obovate or oblong, acute, strongly many-veined, petiole 2–3 ft., very stout, rough, clouded dark and light green; spathe broadly campanulate, pointed, 6–10 in. broad, and as deep from the base to the lip, margin recurved, undulate and crisped, strongly closely veined, greenish pink externally with pale ocellated blotches, base within purple, rough and warted, ped. short, stout, elongate in fr., surrounded by long flaccid sheaths; spadix about as long as the spathe, appendage very variable in size, up to 8 in. long by 5 diam., globose, conoid or amorphous, sinuously lobulate, dark red purple, spongy within; male infl. subturbinate, about 3 in. long, 1–2 in. diam., anth. densely crowded, pale yellow, pollen vermiform; fem. infl. 3 in. long or more, up to 2½ in. diam.; ov. densely crowded, sessile, depressed-globose, style ½ in., stout, ascending, purple, stigma large, 2–3-lobed; berries 2–3-seeded, red.

Moist low country to 2000 ft.; common, especially near the coast; extremely abundant between Galle and Matara. Fl. December–March; very fetid, in the evening especially.

Also in Peninsular India, Andaman Is., Java, &c.

Cultivated for the farina in the tubers.

No doubt this is the plant called *A. Rex*, Prain in Fl. B. Ind. vi. 514 (from Java and the Andaman Is.), so well figured (as *A. campanulatus*) in Blume, Rumphia, above quoted. I cannot see that it is distinct from *A. campanulatus* (*Arum campanulatum*, Roxb.) of India. It varies much in size.—*Trimen.*

I think that Dr. Trimen's view of the identity of *A. Rex* with *A. campanulatus* is open to question. Besides being a much larger plant, the spadix of *A. Rex* rises high above the spathe, and bears an appendage 10–14 in. long, and the leaflets attain 6–10 in. long.—J. D. H.

2. **A. dubius,** *Bl. Rumphia* i. 142 (1835).

Herm. Par. Batav. 90. Burm. Thes. 90. Thw. Enum. 335.

Fl. B. Ind. vi. 514. Rheede, Hort. Mal. xi. t. 18. Bot. Mag. t. 5187 (from a Ceylon specimen).

Tuber 5–6 in. diam.; l. as in *A. campanulatus*, but appearing with the flowers; spathe about 6 in. long, convolute and broadly tubular below for about 3 in., then dilating into a broadly campanulate, ovate, acute limb, with waved at length revolute margins, pale purplish green, blotched or mottled with white externally, margins bright green, within vinous purple; ped. 3 in. when flowering, with scarious sheaths at the base; spadix 4–6 in., very stout, appendage ovoid-globose, 2 in. diam., obscurely corrugated, purple, top rounded, male and fem. infl. as in *A. campanulatus.*

Moist low country; apparently rare. I only know it as an inhabitant of the Gardens at Peradeniya, where it is apparently wild. Rambukkana (Thwaites). Fl. April.

Also in Malabar (?).

I doubt this being other than a smaller variety of *A. campanulatus.* The spathe is frequently blotched or spotted with white, and it then seems the *A. virosus*, N. E. Br. figured in Bot. Mag. t. 6978.

[*A. giganteus*, Bl., beautifully figured in Rumphia, i. t. 34, is given by Blume as a native of Ceylon, but in error.]

8. SYNANTHERIAS, *Schott.*

Tuber depressed-globose, bulbilliferous; l. 1 or 2, appearing with the fl., 3-partite, segments pinnatifid, veins pinnate meeting in an intramarginal one; spathe long-peduncled, very short, sacciform, convolute, suddenly narrowed into a very short, erect, acute point or cusp; spadix stipitate, appendage sessile, long, caudiform, infl. cylindric, as long as the spathe, male of scattered or fascicled groups of anth., distant from the fem., with interposed oblong, depressed peltate, smooth neuters; anth. minute, sessile, obcuneate; ov. small, globose, style very short, or 0, stigma capitate, 3-lobed, ovules sub-basilar, anatropous; fr. of globose berries; seeds of *Amorphophallus.*—Monotypic.

S. sylvatica, *Schott, Gen. Aroid.* t. 28 (1858).

Herm. Par. Bat. 88 (?). *Amorphophallus zeylanicus*, Bl. Rumph. i. 148; Thw. Enum. 335. *Brachyspatha zeylanica*, Schott, Syn. Aroid. 36; Thw. Enum. 443. Trim. Syst. Cat. 98. C. P. 3733.

Fl. B. Ind. vi. 518. Wight, Ic. t. 802 (*Arum sylvaticum*), Bot. Mag. t. 7190 (from a Ceylon specimen).

Tuber 1–2½ in. diam.; l. long-petioled, a foot broad or less, leaflets few, ovate-lanceolate or oblanceolate, acuminate or caudate, 5–6 in. long, lower on the divisions smaller, petiole 6–18 in., pale green, streaked with darker; ped. up to 8 in. long, pink clouded with dirty green, basal sheaths short, scarious, pale pink; spathe 1–3 in. long, pale pink spotted with green, purple within towards the base; spadix up to 10 in. long, erect, appendage up to 7 in. by ¾ in. diam., but often more slender, sometimes tapering from the middle to base and apex, purple, smooth; anth. in groups of 4–6, minute, purple or pale pink; ov. green, stigma yellow; neuters as large as the groups of stamens or larger, oval or oblong, disciform, pale, shining.

Dry region; rather common. Trincomalie, Paterson, 1782 (Herb. Mus. Brit.); Dambulla; Habarana; Polonama; Uma-oya. Fl. Sept., Oct.

Also in S. India.

According to Bl. (l. c.), this was obtained by Kœnig in woods between Tangalla and Matara, and by him sent to Van Royen.

Schott and Engler both having kept *Synantherias* as a distinct plant from *Amorphophallus zeylanicus*, I gave both species in my Syst. Cat. Ceyl. Pl. 98, though suspecting they were really the same. Sir J. Hooker, in Bot. Mag. l. c., has finally settled the question.

Trimen, in a note in Herb. Peraden., describes the appendage of a specimen collected at Habarana, Sept. 1885, as coppery, purple, or yellow.—J. D. H.

9. REMUSATIA, *Schott.*

Tuberous herbs, flowering and leafing in alternate years (?) emitting long, leafless, bulbilliferous shoots from the crown of the tuber; l. solitary, entire, peltate; spathe coriaceous, tube convolute, constricted at the mouth, accrescent, limb spreading or reflexed, explanate, deciduous; spadix very short, sessile, fem. infl. included in the tube, male exserted, appendage 0; male and fem. infl. distant, male clavate, of densely packed flat-topped anth. mixed with neuters, connective cubical, fleshy, with 2–3-small immersed anth.-cells opening by terminal slits; fem. infl. short, cylindric, ov. closely packed, ovoid, 1-celled, stigma sessile, disciform, ovules many, on parietal placentas, orthotropous; berries few, small; seeds with an axile embryo and endosperm.—Sp. 2 in *Fl. B. Ind.*

R. vivipara, *Schott, Meletem.* i. 18 (1832).
Colocasia vivipara, Thw. Enum. 336. C. P. 2323.
Fl. B. Ind. vi. 522. Wight, Ic. t. 798 (*Arum viviparum*).

Tubers 1–1½ in., clustered, depressed, rooting from the crown; bulbilliferous shoots simple or very shortly branched, annulate, 6–12 in. long, and as thick as a goosequill or thicker, ascending, flexuous, bearing at the nodes clusters of oblong, squarrosely scaly bulbils $\frac{1}{10}$–¼ in. long; l. peltately long-petioled, 5 by 3½ in. to 18 by 12 in., membranous, orbicular, ovate or cordate, acute or acuminate, basal lobes rounded, sinus obtuse, veins 3–5 from the top of the petiole and 3–4 pairs from the midrib, all meeting in an intramarginal one, and all united by very slender close-set simple venules, petiole 6–12 in., sheath very short; spathe 4–5 in. long, coriaceous, tube 1–2 in., oblong or ovoid, green, limb 2–3 in., broadly orbicular-ovate or -cordate, explanate, 2–3 in. broad, golden yellow; spadix 1–1½ in., male portion ¼ in. long.

Rocky places in forests of lower montane zone; rather common. Fl. also on hills of India, Burma, Java.

The foliage is quite like a *Caladium*.

10. COLOCASIA, *Linn.*

Rootstock tuberous; l. large, very stoutly peltately petioled, ovate-cordate or hastate, with a triangular basal sinus; spathe stoutly peduncled, tube thick-walled, oblong, accrescent, persistent, mouth constricted, limb long, lanceolate; spadix shorter than the spathe, stipitate, appendage cylindric or subulate; male and fem. infl. distant, with interposed flat neuters, male of densely packed cubical anth. or groups of anth. with immersed cells opening by terminal slits; fem. of crowded, globose, 1-celled ov., stigma pulvinate, ovules many, orthotropous; berries obconic or oblong; seeds oblong, furrowed, endosperm copious, embryo axile.—Sp. 6 or 7; 6 in *Fl. B. Ind.*

C. Antiquorum, *Schott, Meletem.* i. 18 (1832). **Gahala,** *S.* Thw. Enum. 335. *Arum Colocasia*, L., and *Caladium nymphæifolium*, Vent., Moon, Cat. 64. *C. esculentum*, Vent. C. P. 3724. Fl. B. Ind. vi. 523. Wight, Ic. t. 786. Rheede, Hort. Mal. xi. t. 22.

Tuberous rootstock short, or elongating underground for several feet, giving off long sheathed bulbilliferous runners from the base; l. 6–16 in., dark green, sometimes clouded with black, bifid half way from the base to the insertion of the petiole, basal lobes rounded, midrib beneath very stout, penniveined, with 5–7 veins radiating from the top of the petiole, which is 3–4 ft. long, green or violet, sheath narrow; spathes solitary or fascicled, stoutly peduncled, 8–12 in. long, erect, narrow, green, tube 2–3 in., narrowly ellipsoid, limb erect, lanceolate, acuminate, convolute; spadix about half as long as the spathe, slender, appendage 1–3 in., cylindric or subulate; male and fem. infl. each about $1\frac{1}{2}$ in. long, separated by an interval covered with flat oblong neuters.

Streams and wet places throughout the island; very common. Fl. most seasons. Cultivated in all hot countries.

It is difficult to say where this is wild; it is very much cultivated and under many varieties. These are distinguished as Kandala, Tadala, Yakutala, Wel-ala, &c.—*Trimen.*

Roxburgh, Wight, and others, consider this plant to be wild over the greater part of Tropical India. It is extensively cultivated, as the Kachu in Bengal, &c.; the Taro in the Pacific Islands; Eddoes, Cocoes, and Tanias in the W. Indies; and Egyptian Arum in Italy. All parts of the cultivated plant are eaten, but especially the starch of the tubers, which attain 6 in. in diameter.—J. D. H.

11. ALOCASIA, *Schott.*

Rootstock tuberous, sometimes ascending and caulescent; l. large, very stoutly petioled, peltate or not; spathe stoutly

peduncled, tube thick-walled, accrescent, persistent, mouth constricted, limb deciduous; spadix as long as the spathe or shorter, appendage various, infl. and fr. as in *Colocasia*, but ovules few, basilar erect.—Sp. about 30; 13 in *Fl. B. Ind.*

L. not or hardly peltate . . . . 1. A. CUCULLATA.
L. peltate . . . . 2. A. MACRORRHIZA.

***A. cucullata,** *Schott, Syn. Aroid*, 48 (1856). **Panu-habarala,** *S.*
Colocasia cucullata, Schott, Thw. Enum. 336. C. P. 3746.
Fl. B. Ind. vi. 525. Wight, Ic. t. 787.

Rootstock caulescent, 1–2 ft. long, as thick as the wrist, branched, the branches inclined and ascending; l. 6–12 by 4–7 in., hardy peltate, broadly ovate-cordate, dark green, basal lobes concave, rounded, sinus acute, lower veins stout, radiating from the top of the petiole, flabellately spreading, midrib with 3–5 pairs of strong veins, petiole 1–3 ft., very stout, terete, tapering upwards from a short sheath; ped. axillary, shorter than the petiole, tapering upwards, spathe 6–12 in., erect, tube 2–4 in., narrowly ellipsoid, fleshy, green, limb narrowly cymbiform, yellow or green; spadix shorter than the spathe, cylindric, appendage 1½–2 in., conoid, acute or obtuse, sinuously sulcate; anth. connate in short cylindric 8–10-celled masses; ov. densely packed, angular, stigma sessile, 2–3-lobed, yellow.

In native gardens in the low country, and semi-wild. Fl. Feb.
Also in Bengal and Burma.
Rootstock used for food in famine times.

A. alba, Schott, is given for Ceylon only by Engler (Mon. Arac. 500), on the faith of a specimen in Burmann's Herb. In Fl. B. Ind. vi. 528, this is stated to be a Javan species.

A. indica, Schott, *Rata-ala*, *Désa-ala*, S., is much cultivated; it is closely allied to *A. cucullata*, but has deeply sagittately cordate l. 2–3 ft. long, narrower spathe, longer spadix with the appendage longer than the infl.

***A. macrorrhiza,** *Schott, Syn. Aroid*, 45 (1856). **Habarala,** *S.*
Herm. Parad. Bat. 73; Mus. 63 and 71. Burm. Thes. 34. Fl. Zeyl. n. 327. *Arum macrorrhizum*, L. Sp. Pl. 965; Moon, Cat. 64. *Colocasia macrorhiza*, Schott, Thw. Enum. 336. C P. 3725.
Fl. B. Ind. vi. 526. Wight, Ic. t. 797 (*Arum odorum*, Roxb.).

Rootstock extensively creeping, then ascending, 2–3 ft. high, sometimes as long and thick as a man's arm, annularly scarred; l. 2–4 ft. by 6–18 in. broad, long-petioled, peltate, broadly sagittately ovate, margins subundulate, basal lobes rounded, incurved, sinus narrow, midrib stout, penniveined, and with two strong basal veins descending into the basal lobes, petiole 2–4 ft,, base sometimes about as thick as the

wrist; spathes 2 or more together, very stoutly peduncled, 6--12 in. long, odorous, tube 3-4 in., narrowly ellipsoid, limb narrowly cymbiform, top hooded and cuspidate, pale green, sometimes spotted or streaked with red; spadix nearly as long as the spathe, appendage nearly as long as the infl., cylindric, obtuse, smooth or sinuously sulcate, pale yellow or greenish; anth. as in *A. cucullata;* ov. incompletely 4-celled, stigma subsessile, pulvinate, entire; berries the size of a cherry.

In native gardens common, but generally cultivated, and probably originally introduced. Fl. Feb.; spathe pale green, fragrant.

In all tropical countries.

A. fornicata, Schott. Specimens collected at Colombo by Ferguson (C. P. 3764) are referred to this in Thw. Enum. 432; they are scarcely sufficient for certain determination. Figured in Wight, Ic. t. 792. It may be recognised by the greenish-yellow cymbiform spathe 3-4 in. long, the ov. with a distinct style, and a 3-4-lobed stigma.—J. D. H.

12. **RAPHIDOPHORA,** *Schott.*

Lofty climbers, by means of aerial roots, which are free and often of great length, reaching the ground and rooting; l. distichous, large, entire, lobed, perforate, or pinnatifid, petiole geniculate at the top; spathe axillary, ovate, acuminate, very thickly coriaceous or fleshy, tube 0; spadix sessile, cylindric, densely clothed with closely packed bisexual fl.; perianth 0; appendage 0; stam. 4-6, fil. flattened, anth. terminal; ov. sessile, 4-6-angled, 1-2-celled, crown flat or conical, stigma sessile, pulvinate, ovules many, on parietal placentas; berries coherent or confluent, many-seeded; seeds cylindric or turbinate, testa thin, embryo straight, in copious endosperm.—Sp. 23; 20 in *Fl. B. Ind.*

L. entire or nearly so, perforate or not . . . 1. R. PERTUSA.
L. pinnatisect . . . . 2. R. DECURSIVA.

1. **R. pertusa,** *Schott in Bonplandia*, v. 45 (1857).

Dracontium pertusum, Willd., Moon, Cat. 30. *Scindapsus Peepla*, Thw. Enum. 336 (? Schott). C. P. 3667.

Fl. B. Ind. vi. 546. Rheede, Hort. Mal. xii. tt. 20, 21. Wight, Ic. t. 781 (*Scindapsus pertusus*).

Stem climbing the highest tree-trunks, cylindric, $1\frac{1}{2}$ in. diam., green, smooth, leafy for the greater part of its length; l. 8--18 by 6-10 in., broadly ovate or ovate-cordate, cuspidate, dark green, entire or sparingly lobed, primary veins 5-8 pairs, connected by anastomosing veinlets, petiole about as long as the blade, deeply channelled, young winged, wings not auricled at the top, basal sheaths 4-5, oblong, obtuse, brown; spathe

shortly stoutly peduncled, 5–7 in., ovate-oblong or cylindric, cymbiform, acuminate or cuspidate, yellow; spadix sessile, shorter than the spathe, very stout, cylindric, $\frac{2}{3}$ in. diam., top rounded; fl. hexagonal; stam. 8 (Ic. Herb. Peraden.), fil. very stout, sometimes bifid, anth. small; ov. 6-gonous, stigma linear, raised on a short stout style.

Climbing on trunks of large trees in moist low country; rather rare. Fl. March.

Also in Peninsular India, and Malay Islands.

Moon gives an S. name 'Nilwœlla' for this.

I follow Fl. B. Ind. in referring this to *R. pertusa*, but I have never seen leaves, young or old, with perforations or lobes. A closely allied plant, commonly cultivated in gardens, always has them perforated.

2. **R. decursiva,** *Schott in Bonplandia*, v. 45 (1857). **Dada-kehel,** *S.*

Dracontium pinnatifidum, Moon, Cat. 30. *Scindapsus decursivus*, Schott. Thw. Enum. 336. C. P. 2322.

Fl. B. Ind. vi. 547. Wight, Ic. t. 779 (*Scind. decursivus*, bad). Bot. Mag. t. 7282.

Stem climbing the loftiest trees, cylindric, up to 1 in. diam., leafy almost throughout their length; aerial roots descending to the ground; l. 1–3 ft., broadly oblong, cordate, pinnatisect, coriaceous, segments 8–15 pairs, 6–18 by 1–2 in., falcately ensiform, acuminate, costate and with several longitudinal parallel veins and intermediate venules, petiole 1–2 ft., as thick as the little finger; spathe 5–8 in., thickly coriaceous or fleshy, subcylindrically cymbiform, acuminate or beaked, bright yellow, peduncle 3–6 in., $\frac{1}{2}$–$\frac{3}{4}$ in. diam.; spadix as long as the spathe or shorter, stout, cylindric, up to 1 in. diam.; stam. 4, fil. linear, flattened, anth. small, terminal, cells oblong; ov. cuneiform, 4-angled, top suddenly narrowed into a short, stout, conical style; stigma disciform.

Climbing on trunks of large trees in montane zone; very common. Fl. March (?).

Also in Assam, Sikkim, Khasia, &c., and Java, but not in Peninsular India.

This magnificent climber is a very familiar and conspicuous plant in our hill-forests, its numerous spreading leaves completely draping the trunks of old trees.

13. LASIA, *Lour.*

A stout, tall, marsh plant; rootstock branched, and petiole, peduncle, and leaf-veins beneath all armed with short straight spines; l. long-petioled, hastate, entire or pedately pinnatifid; spathe very long, narrow, fleshy, twisted, base convolute, deciduous; spadix short, cylindric, densely clothed with bisexual fl.; sep. 4–6, short obovate, tips truncate, incurved; stam. 4–6, fil. short, flat, anth.-cells parallel, slits introrse;

ov. ovoid, 1-celled, style stout, stigma a depressed disk, ovule solitary, pendulous from the top of the cell, semi-anatropous; berries obpyramidal, 6-angled, top muricate; seeds compressed, rugose, endosperm 0, embryo macropodous.—Monotypic.

L. aculeata, *Lour. Fl. Cochinch.* 81 (1790). **Kohila,** *S.*
Herm. Par. Batav. 75; Mus. 56, 64. Burm. Thes. 34. Fl. Zeyl. n. 328. *Dracontium spinosum,* L. Sp. Pl. 967; Moon, Cat. 30. *L. Hermanni,* Schott in Bonpl. l. c. *L. spinosa,* Thw. Enum. 336. C. P. 2978.
Fl. B. Ind. vi. 550 (*L. heterophylla,* Schott). Wight, Ic. t. 777 (*L. heterophylla,* Schott).

Rootstock creeping, 1 in. diam.; l. 6–18 in. long, rigidly coriaceous, young hastate or sagittate, old pinnatifid, segments lanceolate, acuminate, smooth above, beneath costate, and strongly penniveined, midrib and veins naked or spinous beneath, petiole 2–4 ft., terete, base sheathing; spathe 8–14 in., spirally twisted above the spadix, about as thick as the little finger, acute, green or yellowish, margins very dark purple except at the base, open at the base only when the pollen is being discharged, closing afterwards; spadix about 1 in., claret-col'd., fruiting 4–5 in. and 1 in. diam.; fl. sessile, perianth-segm. 4–5, concave, dorsally hooded, dull pink; fil. very broad, anth.-cells oblong, divaricate below; ov. short, columnar, green, stigma large, sessile, pulvinate, pink; fr. an oblong or capitate syncarp 2 in. diam., of muricate berries ½ in. diam.

Moist low country; rather common. Fl. Dec.

Also in Assam, Bengal, China, Burma, Malaya; not in Peninsular India.

Very variable in foliage; Engler (Mon. 274) makes a variety of *L. Hermanni,* Schott, with very much-divided leaves.

Rootstock eaten in famine times.

14. **POTHOS,** *L.*

Evergreen, branching shrubs, climbing by aerial roots; l. distichous, entire, coriaceous, articulate on the winged or slender petiole, costa stout, veins very many with anastomosing venules, all meeting in an intramarginal vein; spathe small, reflexed, cymbiform or elongate, coriaceous, persistent, ped. short or long, stout or slender, sometimes deflexed; spadix sessile or stipitate, globose, ovoid, oblong, or linear, densely covered with bisexual fl.; sep. 6, short, tips incurved; stam. 6, fil. flat, anth.-cells oval, slits extrorse; ov. ovoid or depressed, 3-celled, cells 1-ovuled, stigma small, sessile; ovule in the innner angle of the cell, anatropous; berries 1–2-seeded;

seeds compressed, endosperm 0, embryo macropodal.—Sp. about 50; 16 in *Fl. B. Ind.*

Petiole broad, flat . . . . 1. P. SCANDENS.
Petiole slender . . . . 2. P. REMOTIFOLIUS.

1. **P. scandens,** *L. Sp. Pl.* 968 (1753). **Pota-wel,** *S.*
Herm. Mus. 6. Burm. Thes. 197. Fl. Zeyl. n. 329. Moon, Cat. 11. Thw. Enum. 336. C. P. 2321.
Fl. B. Ind. vi. 551. Wight, Ic. t. 776.

Stem as thick as the little finger, terete, smooth, copiously branched and leafy, the plant clothing tree trunks and walls like ivy, internodes $\frac{1}{2}$–1 in.; l. very variable, 2–4 by $\frac{1}{3}$–2 in., obovate, oval or lanceolate, acute, acuminate or apiculate, coriaceous, bright green, base cuneate or rounded, petiole broadly winged, 1–3 by $\frac{1}{4}$–$\frac{2}{3}$ in., base $\frac{1}{2}$-amplexicaul; ped. $\frac{1}{6}$–$\frac{1}{4}$ in., base clothed with imbricating, acute, coriaceous bracts; spathe $\frac{1}{6}$–$\frac{1}{4}$ in., cymbiform, cuspidate, green; spadix as long as the spathe, stipitate, globose, ovoid or shortly oblong, stipes as long as the infl.; fl. immersed in the rhachis; fil. short, broad, anth. terminal, minute, cells divaricate; ov. 3-celled, truncate, stigma minute, lobulate; berries $\frac{1}{2}$–$\frac{2}{3}$ in. long, oblong, scarlet, few ripening.

Var. β, **Hookeri,** *Engl. Mon. Arac.* 84. *P. Hookeri*, Schott, Aroid. i. 23. Hook. Ic. Pl. t. 175 (from a Ceylon specimen).

L. lanceolate, acuminate, ped. 1$\frac{1}{2}$–2$\frac{1}{2}$ in., decurved, spathe $\frac{1}{3}$–$\frac{2}{3}$ in.

Climbing on tree-trunks in the low country; very common. Fl. Feb.–April.

Throughout India, Burma, China, and Malaya.

Extremely variable in length of petioles and peduncles; var. β seems scarcely worth separating, but it is kept up as a species in Fl. B. Ind. Seeds eaten after boiling.

2. **P. remotiflorus,** *Hook. Ic. Plant.* ii. t. 135 (1837).
P. elliptica, Moon, Cat. 11; Miq. Prod. Fl. Bat. iii. 182; Trim. Syst. Cat. 98. Thw. Enum. 337. *Piper venustum*, Wall. Cat. n. 6666. C. P. 2432.
Fl. B. Ind. vi. 555. Hook. Ic. Pl. t. 135.

Stem in mature plants elongate, scandent, much-branched, rigid, flexuous; in a very early state stems filiform, creeping, closely appressed to stones or bark; l. dimorphous, in mature plant 3–6 by $\frac{3}{4}$–2 in. long, more or less unequal-sided, linear, oblong-lanceolate, oblong or oblanceolate, coriaceous, acute, cuspidate or caudate-acuminate with the tip sometimes 2 in. long, petiole very slender, divergent from the branch, sheath narrow, about half its length; l. in very young plants, bifarious, appressed to stones or bark, orbicular or ovate-

cordate, ½–1¼ in. diam., membranous, 5-veined and reticulate with cross venules; spathe 1–1½ in., linear-lanceolate, apiculate, striate, base rounded; spadix as long as the spathe or longer, stipitate, slender, often zigzag; fl. solitary, distant, spirally disposed; pet. twice as long as broad; ov. apiculate; berries obovoid.

Var. **macrophylla,** *Hook. f.*

Stem stouter, l. 6–9 by 1½–3½ in., oval, shortly acuminate, petiole ½–2 in.

Moist region up to 4000 ft.; rather common, climbing up trunks of trees. Fl. March. Var. β, Pelawatta Mukelana, March 1887 (Trimen). Endemic.

A very variable species; the habit and foliage of the young state is that of a creeping species of *Piper* or *Peperomia*, totally unlike the mature state.

15. **ACORUS,** *Linn.*

Aromatic marsh herbs, rootstock stout, creeping; l. long, distichous, ensiform, costa stout, sheaths equitant, nerves parallel; spathe the ensiform elongate, acuminate summit of the leaf-like stem; spadix sessile, cylindric, densely clothed with bisexual fl.; sep. 6; fil. linear, flat, anth. reniform, cells confluent above, slits extrorse; ov. conical, 2–3-celled, cells 6-ovuled, stigma sessile, minute, ovules pendulous from the top of the cells, orthotropous; berries 3- or more-seeded; seeds oblong, embryo axile in copious endosperm.—Sp. 2; both in *Fl. B. Ind.*

***A. Calamus,** *L. Sp. Pl.* 324 (1753). **Wadakaha,** *S.*
Herm. Mus. 56. Burm. Thes. 6. Fl. Zeyl. n. 132. Moon, Cat. 25. Thw. Enum. 337. C. P. 3745.

Rootstock as thick as the middle finger, creeping and branching; l. 3–6 ft. by ⅔–1½ in., bright green, acute, thickened in the middle, margins waved; spathe 6–30 in. long, ped. (formed of connate ped. and spathe) 1½–1¼ in. broad; spadix 2–4 in. by ½–¾ in. diam. obtuse, slightly curved, green; sep. as long as the ov., scarious; anth. yellow; fr. turbinate, prismatic, top pyramidal.

Cultivated in native gardens and readily established, but I think nowhere indigenous. I have not observed it to flower here.

Throughout Asia, Europe, and N. America. The 'Sweet flag' of England, formerly used to strew the floors of apartments. An essential oil is obtained from the l., and the aromatic rootstock is used medicinally. The names given by Hermann are 'Vazabu' and 'Vazumbo.'

CXLIII.—LEMNACEÆ.

VERY small or minute monœcious, green, floating, gregarious, scale-like, fresh-water fronds, propagated by budding, or by hybernating bulbs, rarely by seed; roots 0, or of one or more capillary fibres produced from a point on the under-surface of the frond, each terminated by an elongate conical root-cap; fl. 1–3 on each plant (rarely produced in some species), most minute, naked or in a sheath, perianth 0; stam. 1 or 2, anth. 1-celled or didymous and 2-celled; ov. 1-celled, style short, stigma truncate or funnel-shaped, ovules 1–7, basal in the cell; fr. a bottle-shaped membranous utricle; seeds 1 or more, testa coriaceous, ribbed, endosperm 0, or fleshy, embryo axile, cylindric, plumule in a lateral slit.

Fronds with roots . . . . 1. LEMNA.
Fronds without roots . . . . 2. WOLFFIA.

1. LEMNA, *Linn.*

Fronds with one or more capillary roots, budding from lateral slits of the frond; fl. produced in separate slits from the buds, at first enclosed in a short sheath; male fl. binate, stam. 1, anth. didymous, dehiscing transversely, pollen globose; fem. fl. a solitary ov. collateral with the male, style very short or 0, stigma disciform, ovules 1 or more.—Sp. 17; 6 in *Fl. B. Ind.*

There are two species of *Lemna* with solitary roots in Herb. Peraden. which I have failed to identify from dried specimens. One is marked from 'St. Sebastian Quay, Colombo, Jany. 1885 (W. F.);' the other, a much larger plant, is ticketed, '*L. minor*, from Tissor Mewa, Kelvin Grove, Feb. 1883 (W. F.).' These should be sought for and carefully described and drawn from living specimens.

Root solitary . . . . 1. L. PAUCICOSTATA.
Roots many . . . . 2. L. POLYRRHIZA.

1. **L. paucicostata,** *Hegelm. Lemnac.* 139 (1868). **Diya-panshi,** *S.* (Moon).

L. minor, Moon, Cat. 61; Thw. Enum. 331 (non L.). C. P. 2379.

Fl. B. Ind. vi. 556. Hegelm. Lemn. t. 8. Griff. Ic. Pl. Asiat. t. 262, 263 (*L. minor*).

Frond $\frac{1}{8}$–$\frac{1}{4}$ in. long, asymmetrical, obovate or obovate-oblong, nearly flat on both surfaces, obscurely 3-veined; root solitary, emerging from a small winged sheath, root-cap acute; ov. 1-ovuled, ovule erect, orthotropous.

On still water; common.

Throughout the Tropics, where it takes the place of the *L. minor* of temperate regions.

2. **L. polyrrhiza,** *L. Sp. Pl.* 970 (1753).
Thw. Enum. 331. C. P. 2378.
Fl. B. Ind. vi. 557. Hegelm. Lemn. tt. 13–15 (*Spirodela polyrrhiza*).

Fronds $\frac{1}{4}$–$\frac{1}{3}$ in. diam., broadly obovate or orbicular, 7-veined, flat and bright green above, spongy and usually purplish beneath, epidermal cells with sinuous walls, roots many, in one tuft; spathe 2-lipped; stam. 2; ovules 1–2, erect, semianatropous.

Floating on still water, especially tanks, in the dry region; common. Fl. not seen.

In moist temperate and many tropical regions of the world; common in England.

2. WOLFFIA, *Heckel.*

Fronds subglobose, budding from the upper surface; roots 0; cells of epidermis with straight [not sinuous] walls; fl. produced from slits in the upper surface of the frond, sheath 0; male fl. a solitary stam., anth. globose, 1-celled, pollen smooth; fem. fl. a solitary ov., collateral with the male, globose, stigma disciform, ovule solitary, orthotropous; seed erect, testa thick, endosperm scanty, embryo oblong.—Sp. 12; 2 in *Fl. B. Ind.*

W. arrhiza, *Wimm. Fl. Schles.* 140 (1857).
Trim. in Journ. Linn. Soc. xxiii. 174, and Syst. Cat. Ceyl. 98.
Fl. B. Ind. vi. 557. Hegelm. Lemn. t. ii. f. 16, 17, iii. f. 1–12.

Frond $\frac{1}{20}$ in. diam. or less, oblong-ovate, convex on both surfaces, moist and spongy beneath.

Floating on still water in the low country; apparently rare. Colombo (Ferguson); Anuradhapura. Easily overlooked.

Throughout the world in temperate and especially tropical regions. Occurs in England.

CXLIV.—TRIURIDEÆ.

VERY slender, leafless, monœcious or diœcious annuals; stem sub-simple, wiry, flexuous, bearing a few distant small scales; fl. small or minute, in terminal racemes or corymbs, pedicels bracteate; perianth inferior, 4–8-partite, segm. subequal or alternate ones longer, valvate in bud, persistent; male fl.:—stam. 3–8, fil. very short or 0, anth. 2-celled, cells confluent dehiscing outwards or transversely; fem. fl.:—ov. of many free, 1-ovuled carpels, on a central receptacle, style ventral or basal, persistent, stigma punctiform, capitellate or penicillate,

ovule erect, anatropous; fr. a head of 1-seeded carpels, pericarp soft or hard; seed free or adherent to the cell-wall; endosperm hard, granular, embryo minute, globose, in the base of the endosperm.

1. **SCIAPHILA,** *Bl.*

For characters, see Order.—Sp. 12; 4 in *Fl. B. Ind.*

Style much shorter than the ov.
 Stam. 6, stigma capitellate . . . . . 1. S. ERUBESCENS.
 Stam. 3, stigma penicellate . . . . . 2. S. SECUNDIFLORA.
Style much longer than the ov. . . . . . 3. S. IANTHINA.

1. **S. erubescens,** *Miers in Proc. Linn. Soc.* ii. 74 (1850).
Thw. Enum. 294. *Aphylleia erubescens*, Champ. in Calc. Journ. Nat. Hist. vii. (1847), 468. Miers in Trans. Linn. Soc. xxi. 48. C. P. 2666.
Fl. B. Ind. vi. 558. Trans. Linn. Soc. l. c. t. 6, f. 1–11 (*Aphylleia erubescens*).

Stem 3–6 in., very slender, wiry, flexuous, simple or sparingly branched, purple, base creeping, underground portion tortuous, pale brown, clothed with radicular fibrils; cauline scales few, small, distant; raceme elongate, laxly very many-fld., fl. male and (fewer) fem. mixed, bracts $\frac{1}{20}$–$\frac{1}{15}$ in., lanceolate, acuminate, spotted, pedicels $\frac{1}{6}$–$\frac{1}{4}$ in., wiry, spreading, tortuous and decurved; fl. about $\frac{1}{12}$ in. diam., segm. 6, all reflexed from the base after flg., 3 ovate-lanceolate, acute, tips naked, 3 much longer, lanceolate, caudate-acuminate, tips bearded with long hairs; male fl.:—stam. 6, minute, in a ring at the base of the segments, fil. very short, anth. orbicular, peltate, dehiscing across the cells, pistillode 0; fem. fl., ov. 12, sessile on a short receptacle, obovoid, style minute, basal, stigma capitellate, papillose or very shortly penicillate; ripe carpels $\frac{1}{60}$ in., cuneately obovoid, pericarp soft, surface papillose, 2-valved; seed loose, ovoid-oblong, testa coriaceous, striate, dark brown.

Damp shady places in moist low country; very rare. Narawella, near Galle (Champion); Poree, near Colombo (Ferguson). Fl. Dec.–April; pale purplish, speckled with red in streaks.
Endemic.
Champion and Miers both figure the perianth of this species as consisting of 3 equal naked segments, but I find that normally 3 of the segments are nearly twice as long as the others, with very slender bearded tips. I do, however, find a few flowers in the same raceme with the others, as figured by these authors. They both describe the ripe carpels as dehiscing by two valves, and the flowers as sometimes bisexual.—J. D. H.

2. **S. secundiflora,** *Thw. in Hook. Journ. Bot.* vii. 10 (1855).
Thw. Enum. 294. C. P. 2665.
Fl. B. Ind. vi. 558.

Stem 6–14 in., simple or rarely branched, flexuous, dull purplish, sheathing scales few, small, distant; raceme 4–6 in.,

fl. secund, about $\frac{1}{6}$ in. broad, male and fem. intermixed, bracts ovate, acuminate, much shorter than the capillary decurved pedicels, which are $\frac{1}{10}$–$\frac{1}{5}$ in. long; perianth-segments 6, subulate, spreading in fr.; male fl.:—stam. 3, anth. sessile, transversely oblong, white; fem. fl.:—ov. many, in a globose head, tubercled, style basal, clavate, hardly as long as the body of the carpel, stigma penicillate; head of ripe carpels globose, $\frac{1}{6}$ in. diam.; carpels obliquely cuneiform, compressed laterally, crown tubercled, pericarp indehiscent, thick, dorsally thickest and chambered transversely within; seed obovoid, embryo very minute, globose.

Shady forests; very rare. I have seen only the C. P. plants collected at Gattehatte, near Sitawaka, in 1853 and 1855. Fl. March–May; dull purple.
Endemic.

3. **S. janthina,** *Thw. Enum.* 294 (1861).
Hyalisma janthina, Champ. in Calc. Journ. Nat. Hist. vii. (1847), 466, Miers in Trans. Linn. Soc. xxi. 49. C. P. 2664.
Fl. B. Ind. vi. 558. Trans. Linn. Soc. l. c. t. 7, f. 1–8. (*Hyalisma janthina.*)

Stem 4–8 in., slender or rather stout, tortuous, dark violet-purple; scales few, small, distant; raceme elongate, fl. irregularly disposed, opp. alt. or occasionally whorled, monœcious or diœcious, bracts very small, ovate, acute, pedicels $\frac{1}{4}$–1 in.; perianth-segments 8, lanceolate, acute, spreading in fr.; anth. 4, sessile, broadly obcordate, dehiscence transverse; ov. many, capitate, smooth; style subbasilar, much larger than the ov., erect, stigma punctiform; head of ripe carpels $\frac{1}{6}$ in. diam., obliquely cuneate, laterally compressed, smooth, pericarp indehiscent, thick, dorsally thickest and chambered transversely within; seed obovoid, compressed, adherent to the pericarp.

Wet forests in the moist low country; rare. Near Galle (Champion); Gattehatte, near Sitawaka (Thwaites); Negombo (Nietner); near Hanwelle (Ferguson); Hewesse; Dolukande. Fl. Jan.–May; pale pinkish-yellow.
Also in Travancore.

CXLV.—ALISMACEÆ.

SCAPIGEROUS, perennial, marsh-loving herbs; l. radical, entire, parallel-veined; fl. in panicled umbels or whorls, uni- or bisexual; perianth inferior, 6-partite in 2 series, 3 outer segm. (sep.) herbaceous, persistent, 3 inner petaloid, involute in bud, deciduous; stam. 6 or 9, perigynous, fil. filiform, anth. versatile, 2-celled, slits subextrorse; carpels few or many, sessile on a

central receptacle, 1-celled, 1-ovuled, style short, stigma simple, ovule solitary, basilar, campylotropous; fr. of many achenes; seed erect, testa membranous, endosperm 0, embryo hooked.

Fl. all bisexual . . . . 1. ALISMA.
Fl. male and bisexual . . . . 2. LIMNOPHYTUM.

1. ALISMA, *Linn.*

For characters, see Order, with the fl. all bisexual.—Sp. 10; 3 in *Fl. B. Ind.*

A. oligococcum, *F. Muell. Fragm. Phyt. Austral.* i. 23 (1858).
A. glandulosum, Thw. Enum. 332. C. P. 2318.
Fl. B. Ind. vi. 560.

Rootstock short, sometimes as thick as the thumb, with numerous stout, simple root-fibres; l. all radical, 3–6 by 2–3 in., broadly oval or ovate, obtuse, base cordate, pellucidly punctate, basal lobes $\frac{1}{6}$–$\frac{1}{4}$ the length of the l., acute or obtuse, sinus narrow, primary veins 8–17, radiating from the top of the petiole, stout beneath, with many parallel secondary and cross venules, petiole 1–3 ft., stout, angular; submerged l. narrower, membranous, petiole flexuous; panicle 6–9 in. broad and long, branches whorled, angular, bracts large, herbaceous, ternately whorled, lower up to 3 in. long, lanceolate, acuminate; fl. ternately whorled, about $\frac{1}{3}$ in. across, pedicels up to 2 in. long, decurved or divaricate in fr.; sep. ovate-oblong or orbicular, obtuse, green, gland-dotted, much smaller than the pet., spreading or revolute in fr.; pet. $\frac{1}{4}$ in. long, lanceolate, acute, shortly clawed, white or faintly rose-col'd.; stam. very small, anth. subsessile, broad; carpels 6, whorled, broadly ovoid, style short, slender, terminal, deciduous; achenes 2–6, $\frac{1}{12}$–$\frac{1}{8}$ in. long, reniformly ovoid, laterally compressed, epicarp thin, endocarp hard, with 4 dorsal, strongly tubercled ridges.

Tanks, &c., in the dry region; rather rare. Kurunegala; Dambulla; Ligiri; Anuradhapura. Fl. March; white or pale rose-col'd.
Also in India, Trop. Africa, and Australia.

2. LIMNOPHYTUM, *Miq.*

For characters, see Order, with the fl. male or bisexual.—Monotypic.

L. obtusifolium, *Miq. Fl. Ind. Bat.* iii. 242 (1855).
Sagittaria obtusifolia, L., Moon, Cat. 64. *Alisma obtusifolium*, Thw. Enum. 332. C. P. 2317.
Fl B. Ind. vi. 560. Rheede, Hort. Mal. xi. t. 45.

Rootstock short, stout, with numerous long stout simple root-fibres; l. all radical, 6–12 by 4–8 in., sometimes as broad as long, reniformly or deltoidly sagittate or triangular, glabrous or puberulous on both surfaces, basal lobes long, tapering, spreading, as long as the rest of the blade, acute or obtuse or tip rounded, sinus very broad, open, primary veins 11–13 pairs, radiating from the top of the petiole, secondary remote, with irregular reticulation between them, petiole 2–3 ft., very stout, striate, channelled above; panicle with the stout angular ped., 2–4 ft. long, erect or declinate, branches long, erecto-patent, the lower 4-nately whorled, bracts whorled, broadly ovate-lanceolate, acuminate, lower an inch long, veins parallel; fl. 4–15 in a whorl, $\frac{1}{3}$–$\frac{1}{2}$ in. across, upper mostly male, shortly stoutly pedicelled; pedicel of fem. and bisexual fl. 1–3 in., very stout; sep. orbicular-ovate, concave, ribbed, green; pet. broadly obovoid, $\frac{1}{6}$ in. long and broad; fil. flattened, base dilated, glandular-pubescent; ov. in bisexual fl. 15–20, in concentric whorls; achenes in a globose head $\frac{1}{2}$–$\frac{2}{3}$ in. diam., obovoid, turgid, endocarp dorsally 3-ribbed.

Tanks and still waters, chiefly in the dry region; rather common. Fl. Feb., Sept.; white.

Also in India, Trop. Africa, and Madagascar.

CXLVI.—NAIADEÆ.

AQUATIC herbs, of fresh or salt water, very various in habit; rootstock stout or slender, sometimes tuberous, often creeping or 0; stem floating or rooted in the ground; l. entire or serrate, submerged or floating, often stipulate; fl. uni- or bisexual, often minute or inconspicuous, axillary or spicate, naked, or enclosed in a sheath or spathe; perianth 0, or tubular, or of inferior, valvate segments; stam. hypogynous, anth. 1–2-celled; ov. of 1–4, 1-ovuled, free carpels, style and stigma various, ovule erect or pendulous; fr. various; seed without endosperm, embryo macropodous, straight or curved.

Stigma disciform or decurrent on the ovary.
  Perianth of sep.
    Sep. 1–3, white . . . . 1. APONOGETON.
    Sep. 4, herbaceous . . . . 2. POTAMOGETON.
  Perianth 0 . . . . 3. RUPPIA.
Stigma or stigmas subulate or capillary.
  Fresh- or brackish-water plants . . . . . 4. NAIAS.
  Salt-water plants . . . . 5. CYMODOCEA.

1. APONOGETON, *Linn. f.*

Scapigerous fresh-water herbs; rootstock tuberous, crowned by copious root-fibres; l. long-petioled, the floating herbaceous, oblong, submerged membranous, midrib striate, veins parallel; scape inclined, bearing one or a pair of floating or emerged spikes each at first enclosed in a calyptriform membranous sheath; fl. bisexual, perianth of 1–3 equal or unequal, petaloid segm.; stam. 6 or more, hypogynous or perigynous, fil. subulate, unequal, persistent; anth. didymous, slits introrse; ov. of 3–6, free, 1-celled carpels, style short or 0, stigma disciform or decurrent, ovules 2 or more, basilar, anatropous; fr. of 3 or more coriaceous follicles; seeds erect, testa thick or thin, endosperm 0, embryo straight.—Sp. 22; 4 in *Fl. B. Ind.*

Perianth-segm. shorter than the stam. . . 1. A. MONOSTACHYON.
Perianth-segm. much longer than the stam. . 2. A. CRISPUM.

1. **A. monostachyon,** *Linn. f. Suppl. Plant.* 214 (1781). **Koddi,** *T.*

Moon, Cat. 38. Thw. Enum. 333. C. P. 2307.

Fl. B. Ind. vi. 564. Roxb. Cor. Pl. t. 81. Lond. Journ. Bot. iii. (1844), t. 17 (*monostachys*).

Rootstock $\frac{1}{3}$–1 in. diam., stoloniferous; l. 3–6 in., oblong or linear-oblong, acute or obtuse, base cuneate, rounded or cordate, veins 5–7 pairs, 3 central, cross venules numerous, petiole subtrigonous; base narrowly sheathing; scape varying with the depth of the water, spike solitary, 1–6 in. long, cylindric, dense- or lax-fld.; perianth-segm. 2, erect, $\frac{1}{10}$ in., spathulate, stam. 6, as long or longer than the segm., anth. blue-purple; carpels 3, shorter than the stam.; follicles subglobose, $\frac{1}{12}$ in. diam., style subulate; seeds 4–8, oblong, testa lax, 6–8-ribbed, striate, green.

In tanks, &c., in the dry region; common. Fl. Dec.; pale blue or white, anth. blue.

Throughout Trop. Asia and Australia.

Tubers much eaten, and said to be as good as potatoes.

2. **A. crispum,** *Thunb. Nov. Gen.* i. 73 (1784). **Kékatiya,** *S.*

Moon, Cat. 38. Thw. Enum. 333. C. P. 2306, 2308, 3381.

Fl. B. Ind. vi. 564. Lond. Journ. Bot. iii. (1844), t. 18 (*ouvirandra undulata*).

Rootstock subspherical, stoloniferous; l. 1–3 ft., from oblong to linear-oblong, linear, or lanceolate, tip rounded or acute, all submerged and membranous, translucent, undulate, base cuneate, 2-lobed or cordate, 5–9-veined, cross venules conspicuous, petiole compressed, shorter or longer than the blade, up to 10 in. long; scape much longer than the l., terete,

thickening upwards; spike solitary, 3–5 in. long, rhachis stout, elongating in fr.; perianth-segm. 2, $\frac{1}{6}$ in. long, obovate-spathulate, much longer than the stam., white, caducous; stam. 6, fil. spreading, persistent, anth. oblong; carpels 3, minute, narrowed into a very short style, follicles $\frac{1}{4}$–$\frac{1}{3}$ in. long, 1–2-seeded, oblong, beaked, smooth; seed smooth.

In running water up to 6500 ft.; common. Fl. Feb. and May; white. Also in India and Australia.

Thunberg's specimens were from Ceylon. Extraordinarily variable in foliage, as with many aquatics. Tubers eaten in famine times.

2. **POTAMOGETON,** *Linn.*

Submerged brackish- and fresh-water plant, rootstock creeping; stem branched, leafy, upper branches floating, or all submerged; l. broad or narrow, stipules intrafoliaceous; fl. small, spicate on short or long, axillary or leaf-opposed scapes arising from a sheath; spike solitary, ebracteate; fl. small, bisexual, sep. 4, concave, green, valvate in bud; anth. 4, sessile on the bases of the sep., didymous, slits introrse; carpels 4, free, sessile, 1-ovuled, stigma subsessile or decurrent, ovule inserted in the inner angles, capylotropous; drupelets small, epicarp coriaceous or spongy, endocarp hard; seed subreniform, embryo macropodal.—Sp. about 80; 10 in *Fl. B. Ind.*

L. oval or oblong . . . . 1. P. INDICUS.
L. filiform . . . . 2. P. PECTINATUS.

1. **P. indicus,** *Roxb. Fl. Ind.* i. 452 (1832).
P. lateralis, Moon, Cat. 12. *P. natans*, Thw. Enum. 333 (non L.). C. P. 590.
Fl. B. Ind. vi. 565.

Stem slender, and branches terete, long or short, according to the depth of water; l. petioled, upper floating, 3–4$\frac{1}{2}$ by 1–2$\frac{1}{2}$ in., alt. or uppermost opp., oblong or oblong-lanceolate, acute, obtuse or acuminate, thinly coriaceous, opaque, glossy, many-veined, base acute or rounded, petiole shorter than the blade, submerged l. up to 8 in., linear, membranous, undulate, stip. 1$\frac{1}{2}$ in., fully as long as the l. or shorter, bifid; scape 1–2 in., stout or slender, cylindric, not thickened upwards; spike 1$\frac{1}{2}$ in., dense-fld., green; sep. shortly clawed, very convex; drupelets small, smooth, obliquely truncate, shortly beaked when dry.

Ponds, &c., in low country; rather rare. Peradeniya; Ambagamuwa; Colombo Lake. Fl. Feb.–April; green.

Throughout India, Burma, and Malay Islands.

Moon has 'Mal-kékatiya' as S. name.

2. **P. pectinatus,** *L. Sp. Pl.* 127 (1753).

Thw. Enum. 333. *Ruppia subsessilis*, Thw. Enum. 333. C. P. 3531, 3214.

Fl. B. Ind. vi. 567.

Stem filiform, copiously distichously branching, forming with the l. tassel-like masses when taken out of the water; l. all submerged, alt., 1–4 by $\frac{1}{20}$–$\frac{1}{10}$ in., filiform, acute, opaque, 1–3-veined, or lower 5-veined, stipules adnate to the l.-sheath, tips free; scape with the spike 2–3 in., filiform, much longer than the l., not thickened upwards, fl. few, in few very distant whorls, minute, green; sep. suborbicular; drupelets $\frac{1}{6}$ in. long, turgid, dimidiate-obovoid, smooth, slightly compressed, shortly beaked, dorsally rounded, and obscurely 3-keeled.

Lakes and backwaters, often brackish, near the coast; locally abundant. Kalutara; Chilau; Negombo Lake, very abundant; Jaffna. Fl. Dec.–Feb.; pinkish.

Throughout the North Hemisphere; common in England.

Thwaites's *Ruppia subsessilis* (C. P. 3214) is from Jaffna, and is merely a small form of this.

3. RUPPIA, *Linn.*

Submerged, brackish-water plants; rootstock creeping, much-branched; stems slender, dichotomously branched; l. alt. or subopp., filiform, formed of 2 parallel tubes, sheath elongate, narrow; infl. a very small, 2-fld., shortly peduncled spadix, enclosed in an axillary, spathulate, compressed, hyaline spathe, ped. lengthening after flg.; fl. minute, sessile, 2-sexual; perianth 0; anth. 2, sessile, cells reniform, nearly free, slits extrorse, pollen tubular; ov. 4, stipitate, obliquely narrowed into a short style; ovoid, stigma peltate, ovule solitary, pendulous; achenes 4, very small, ovoid, long-stipitate, endocarp hard; seed pendulous, uncinate, embryo macropodous.—Sp. 2; 1 in *Fl. B. Ind.*

R. rostellata, *Koch, ex Reichenb. Ic. Crit. Cent.* ii. 66 (1824).

Fl. B. Ind. vi. 568. Griff. Ic. Pl. Asiat. iii. tt. 257–259.

Whole plant forming tangled submerged masses of filiform, leafy, flaccid stems and branches; l. 2–4 in., very slender, dull olive-green; ped. $\frac{1}{4}$–1 in., not spirally coiled; fl. minute, binate, stipes of ov. rapidly lengthening up to 1 in. long after flg. and spreading; achenes $\frac{1}{12}$ in. long.

In brackish lagoons on the coast; very rare. Only seen from Matalan, N. Prov., where it was collected in 1889 by Mr. Nevill. Fl. Feb.

Throughout Europe and Asia. Occurs in England.

4. NAIAS, *L.*

Submerged fresh or brackish water plants, stem rigid, stout or slender, dichotomously branching; l. opp., alt., or whorled, linear, toothed; fl. axillary, minute, monœcious or diœcious; male fl.:—a single 1–4-celled anth., adnate to the inner surface of a hyaline, tubular spathe, which is again enclosed in a more herbaceous outer spathe, pollen oblong; fem. fl.:—a sessile, naked, ovoid, 1-ovuled carpel, style short, stigmas 2–4, terminal, subulate, ovule basilar, erect, anatropous; fr. an oblong achene; seed oval, testa thin or coriaceous, embryo straight.—Sp. 23; 4 in *Fl. B. Ind.*

The Ceylon specimens of this genus are not sufficient for full description. The species should be described from fresh flg. and frg. plants.

Stem and branches with toothed wings . . . 1. N. MAJOR.
Stem and branches naked.
  Anth. 6-celled . . . . 2. N. GRAMINEA.
  Anth. 1-celled . . . . 3. N. MINOR.

1. **N. major,** *All. Fl. Pedemont.* ii. 221 (1785).
Trim. in Journ. Bot. xxvii. 167.
Fl. B. Ind. vi. 569. Griff. Ic. Pl. As. iii. t. 251, f. 1 (*N. fucoides*).

Stem rather stout, terete, brown, fragile, and branches armed with an interrupted, membranous, green, toothed wing, or teeth; l. $\frac{1}{2}$–1$\frac{1}{2}$ in., subternately whorled, linear, coarsely almost pinnatifidly toothed, teeth 4–8 on each margin and a few dorsal, triangular, base hardly dilated into a sheath with rounded entire sides; fl. diœcious, outer spathe of male oblong, 2–3-toothed; anth. 4-celled; achene $\frac{1}{12}$–$\frac{1}{8}$ in., stigmas 2–3; seed ovoid, testa crustaceous, obsoletely rugose.

Brackish shallow lagoons; apparently very rare. Near Kalmunai, 1885 (Nevill). Fl. May.
Throughout the warmer parts of the Old World.

2. **N. graminea,** *Del. Fl. Egypt.* 282 (1812).
Trim. Syst. Cat. Ceyl. 90, and in Journ. Bot. xxvii. 168. C. P. 3887.
Fl. B. Ind. vi. 569. (?) Griff. Ic. Pl. As. iii. tt. 253, 254 (*N. seminuda*).

Stem 1–2 ft., slender, smooth; l. $\frac{2}{3}$–1 in., opp., ternately whorled or fascicled, linear or subulate, acuminate, flaccid, acutely minutely many-toothed, flat, translucent, auricles of sheath erect, lanceolate, toothed on both margins; fl. monœcious, fascicled; anth. 4-celled; stigmas 2.

Still water in the low country, especially in the shallow lagoons near the coast; rather common. Trincomalie (Glennie); Matalan, N. Prov. (Nevill); Batticaloa (Nevill); Kurunegala; Peradeniya. Fl. Feb.–June.
Warm regions of the Old World generally.
The specimens are insufficient for a satisfactory determination of this

plant, which closely resembles *N. seminuda*, Griff., a species that has been referred to *N. graminea*, but which Griffith describes as having 2-celled anthers, whereas Boissier and others describe the anthers of *graminea* as 4-celled.

3. **N. minor,** *All. Fl. Pedemont.* ii. 221 (1785).

Caulinia indica, Willd., Moon, Cat. 61. Trim. in Journ. Bot. xxvii. 168.

Fl. B. Ind. vi. 569. (?) Griff. Ic. Pl. Anat. t. 252 (*N. ternata*).

Stem very slender, much-branched; l. $\frac{1}{3}$–$\frac{1}{2}$ in., hardly $\frac{1}{20}$ in. broad, very narrowly linear, remotely toothed, basal auricles rounded or truncate, entire or toothed; fl. fascicled, monœcious, outer spathe of male fl. subcylindric, mouth fimbriate; anth. 1-celled, bursting at the apex, stigmas 2; seed narrowly ellipsoid.

Still water in low country. I have only found this in small tanks near Hakmana, S. Prov., and the specimens are not sufficient for certain identification. Moon's locality is Colombo. Fl. (?).

Europe, N. Africa, India.

5. CYMODOCEA, *Kœn.*

Submerged marine herbs; stem or rootstock elongate, creeping, rigid, rooting at the nodes, sending up short branches terminated by a few elongate, linear l., with sheathing membranous bases; l. linear or subterete, bases distichously imbricating, tip often toothed, veins parallel; fl. axillary, solitary or in branched cymes, unisexual; perianth 0; male fl. of 2 2-celled anth., adnate to a slender stipes, cells free at base and apex, slits extrorse; fem. fl. of 2 ovoid, 1-ovuled carpels narrowed into short erect or recurved styles, stigma simple, ovule pendulous, orthotropous; fr. of 2 ovoid, sessile or stipitate, indehiscent carpels, pericarp coriaceous or woody within; seed pendulous, testa thick, embryo macropodous with the radicular end inflexed.—Sp. 9; 4 in *Fl. B. Ind.*

The Ceylon species of this genus want describing from living specimens.

L. flat.
  L. $\frac{1}{4}$–$\frac{1}{3}$ in. broad, many veined . . . . . 1. C. SERRULATA.
  L. $\frac{1}{8}$–$\frac{1}{6}$ in. broad, veins few . . . . . . 2. C. AUSTRALIS.
L. terete, channelled . . . . 3. C. ISOETIFOLIA.

1. **C. serrulata,** *Asch. and Magn. in Sitzb. Ges. Naturf. Berlin* 1867, 3 (1868).

Posidonia serrulata, Spreng., Thw. Enum. 333. C. P. 3056.

Fl. B. Ind. vi. 570.

Stem or rootstock elongate, about as thick as a crow-quill, rigid scarred at the rooting nodes, branches short,

simple, erect, 2–3-leaved; l. 4–8 by $\frac{1}{4}$–$\frac{1}{3}$ in., lorate, straight, or very slightly falcate, tip rounded, toothed, margins quite entire, midrib very slender, veins about 7 pairs, with few distant cross venules, sheath as broad as the blade, $\frac{1}{2}$–1 in. long, flat, with narrowly incurved sides, hyaline, ligule very narrow; fl. and fr. not seen in Ceylon specimen.

In shallow sea-water; rather rare. Trincomalie (Harvey); Galle (Ferguson); Karativu I.; Mannar. There are specimens in Mus. Brit. collected by Kœnig, and labelled '*Thalassia reptans*, Fretum zeylanicum prope Fundi.' It is abundant in the shallows of the Pamban channel between Ramisseram I. and the Indian coast.

On shores of Indian and S. Pacific Oceans and S. Australia.

Extremely similar in foliage to *Thalassia Hemprichii*.

C. ciliata, Ehrenb. I have entered this in Syst. Cat. Ceyl. 99 (with a doubt) as its range is made to extend here in Ascherson's map (Petermann's Geogr. Mitth. 1871), but I have seen no specimen. In Fl. B. Ind. the Ceylon localities for *C. serrulata* are inadvertently entered under this species.—*Trimen.*

2. **C. australis,** *Trim. Syst. Cat. Ceyl. Pl.* 99 (1885).
Trim. in Journ. Bot. xxiii. 174, and Syst. Cat. Ceyl. Pl. 99.
Fl. B. Ind. vi. 570.

Stems very slender, densely interlaced with matted root-fibres; leafing branches 1–4 in., erect, slender, rooting at the lower nodes; l. 6–10 by $\frac{1}{12}$–$\frac{1}{8}$ in., narrowly linear, flat, margins quite entire, coriaceous, tip entire or 3-toothed, veins 3 obscure, a central and 2 marginal, sheath 1 in. long; fl. terminal axillary.

In shallow sea-water; very rare. Only found at Wéligama Bay, S. Prov., where it is abundant.

On coasts of Indian and Pacific Oceans, Malaya, and N. Australia.

3. **C. isoetifolia,** *Asch. in Linnæa*, xxxv. 163 (1867).
C. æquorea, Thw. Enum. 333. Trim. in Journ. Bot. xxiii. 174. C. P. 2380.
Fl. B. Ind. vi. 570.

Stems filiform, densely interlaced, creeping and branching; branches erect, filiform, internodes few, long; l. terminal 3–12 by $\frac{1}{12}$ in. broad, semiterete, deeply grooved, spongy within, tip obtuse, sheath 1–1$\frac{1}{2}$ in., mouth 2-lobed; fl. in peduncled terminal sparingly dichotomously branched cymes 1$\frac{1}{2}$–2 in. long, each pair sessile on a short pedicel, enclosed in a membranous spathiform bract about $\frac{1}{3}$ in. long, bract with sometimes a short leafy tip; male fl. not seen; fem. fl. $\frac{1}{10}$–$\frac{1}{8}$ in. long, consisting of a naked narrow ov. tapering into a much longer, stout, recurved style, stigmatose at the top.

In shallow sea-water; rather common. Galle (Gardner); Bentota (Ferguson); Wéligama; Batticaloa and Puttalam (Nevill); Mannar.

Shores of Indian Ocean, Malaya, and N. Australia.

Gardner's Galle specimens are in flower.

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London: Printed by STRANGEWAYS AND SONS, Tower Street, Cambridge Circus.